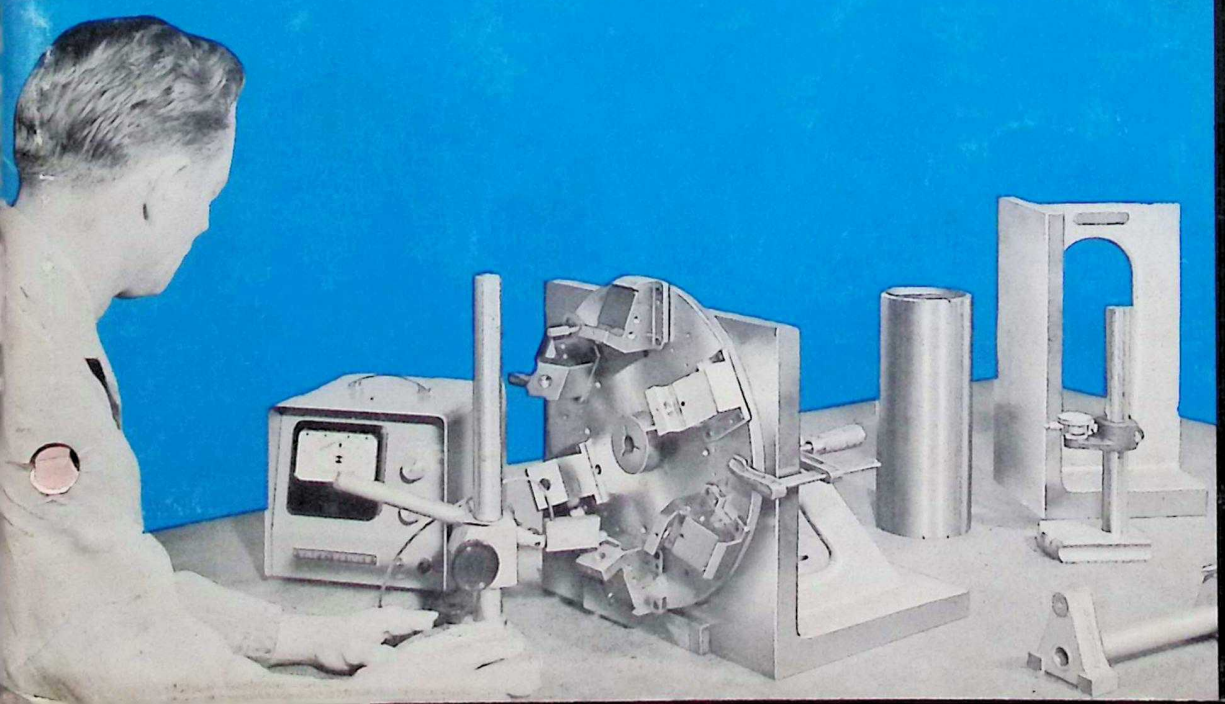
TAFT•PEIRCE

PRODUCTION AND INSPECTION EQUIPMENT

CATALOG NO. 511



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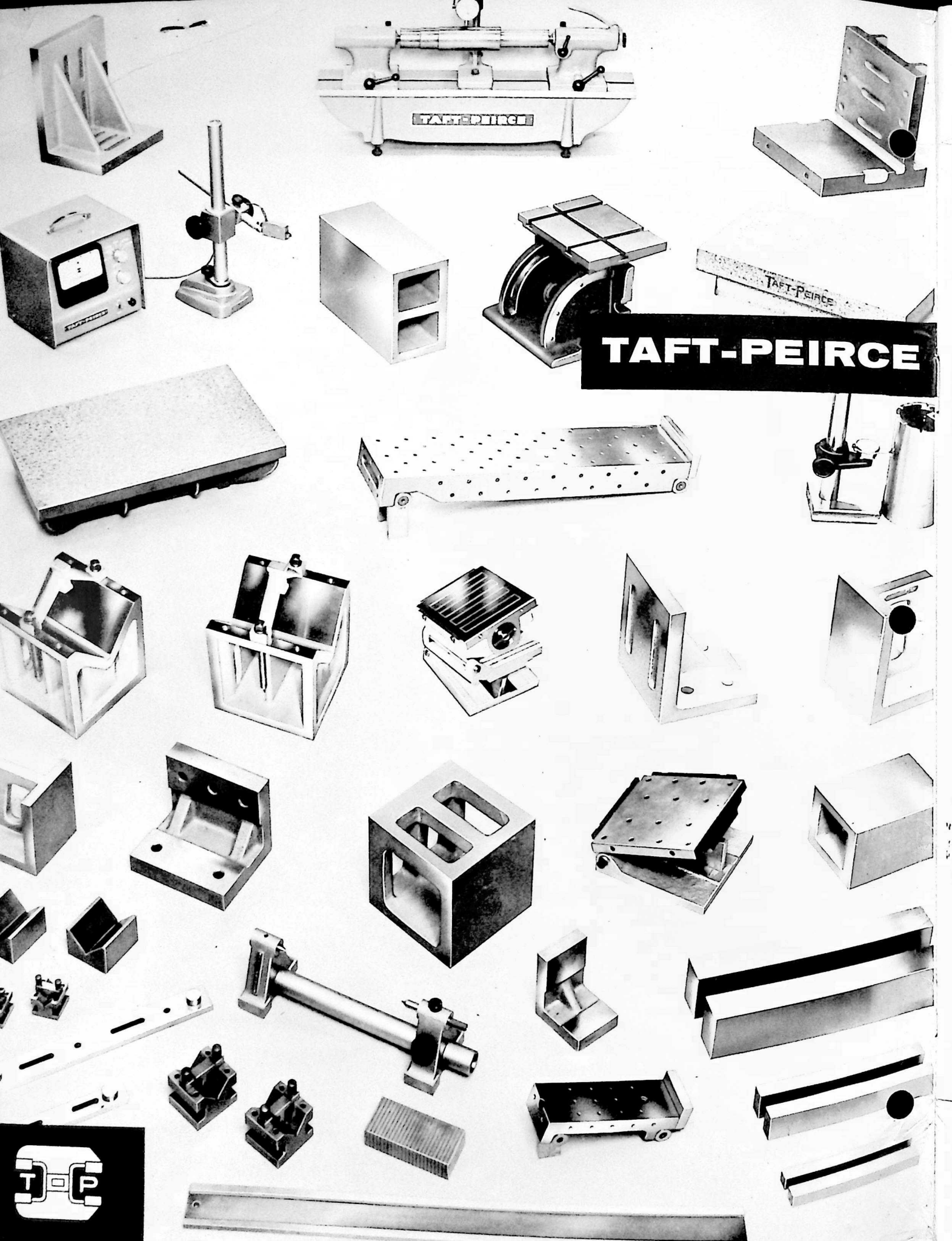


TAFT-PEIRCE

PRECISION PRODUCTION AND INSPECTION EQUIPMENT

Parallel within .0001", square within 5 seconds, .00005" per foot surface accuracy . . . published manufacturing data like this tells the quality story of Taft-Peirce Production and Inspection Equipment. Add to announced manufacturing tolerances the key elements of job-tested design and controlled manufacturing processes, and you have the basic success story of a product line that has proved itself in use for nearly fifty years.

Specifications You Can Trust. There is no secret about the accuracy of this internationally accepted line of tools. Taft-Peirce policy has always been to list key tolerances *in print*. Look for the actual figures as you read through this catalog —you can buy tools with confidence when you know their quality and the reputation of the manufacturer who stands behind them.

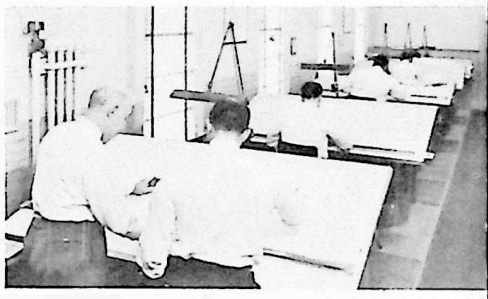
Design Notes, Yesterday and Today. The first tools in this specialized line of set-up, production, and inspection equipment were developed from models originated and proved under actual manufacturing conditions in the world-famous Taft-Peirce Contract Service Division. Through the years, this series of tools has been tested, refined, and expanded, until its breadth and total reliability have earned a reputation unmatched in the field of precision manufacture. Today a full-time research and development group is continually searching for new ideas and recommending changes wherever the performance of existing tools can be improved.

Manufacturing Controls. Taft-Peirce, a Company known for its gagemaking talents, employs a policy of strict quality control. Metallurgical analysis specifies and controls the uniformity of raw material; inspection stations control dimensional relationships of work in process; and final inspection is conducted in up-to-date gaging laboratories equipped with every type of modern measuring instrument.

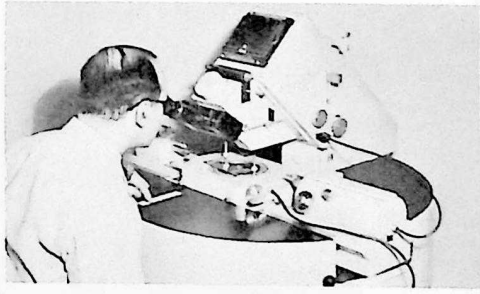
. . . . . .

Taft-Peirce Production and Inspection Tools are available through representatives in your area—ask them, or contact the plant directly, for additional data on standard equipment, or special designs, sizes, and materials needed to meet unusual requirements. For the set-up, production, and inspection equipment that shop men know and trust, make sure you TAKE IT TO TAFT-PEIRCE.

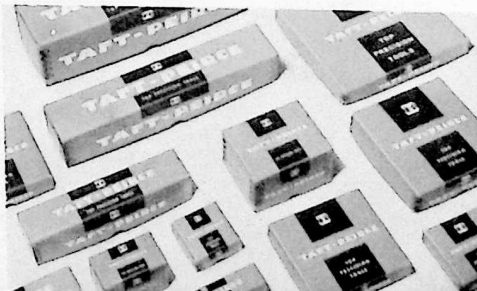
Research and Development. Every day at Taft-Peirce a talented research engineering staff is busy designing new shop tools and studying improvements on existing items.



Final Inspection. Typical gage laboratory activity shows inspector using a Zeiss Universal Measuring Microscope to check an ultra high precision contour gage.

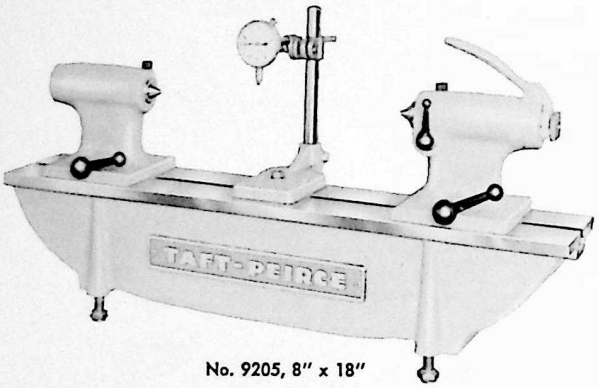


Easy Inventory Control. Taft-Peirce Production and Inspection Tools are packed for convenient shelf stacking in strong metal-edged boxes with contents clearly labeled. Heavier tools are individually boxed or crated for safe transit and storage.



Taft-Peirce Bench Centers offer a fast, accurate method of inspecting work on arbors, mandrels, or directly on centers. A large number of standard and special headstock, tailstock, and bed combinations are available for handling work of practically any length and diameter, and facilities are available for designing and manufacturing special Bench Centers as well as special attachments.

STANDARD BENCH CENTERS
NO. 9205 SERIES

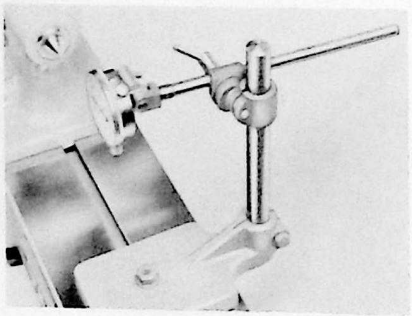


No. 9205, 8" x 18"

Standard Bench Centers are shipped from stock in two sizes with capacities of 8" x 18" and 8" x 36" respectively. Beds are ruggedly proportioned with internal ribbing for maximum strength and rigidity, and are provided with four adjustable buttons for positive leveling. Alignment of head and tailstocks is maintained by keys which fit an accurately located ½" T-slot in the bed. This construction enables the head and tailstocks to be firmly locked at any point on the bed, and also makes it possible to equip the bed with most standard dividing heads.

The center in the headstock is fixed, while the tailstock center is held in a spring-loaded sleeve. Pressing down the lever mounted on top of the tailstock retracts the tailstock center for easy work loading, and a small clamping lever is provided to lock the tailstock center in position when supporting heavy work.

The indicator mounting is keyed to the base T-slot and may be positioned anywhere between the centers and locked in place. The Indicator Bracket, attached to the Mounting by means of a universal clamp, allows the indicator to be adjusted up or down, swung 360° vertically, horizontally, or axially, and locked in any position.

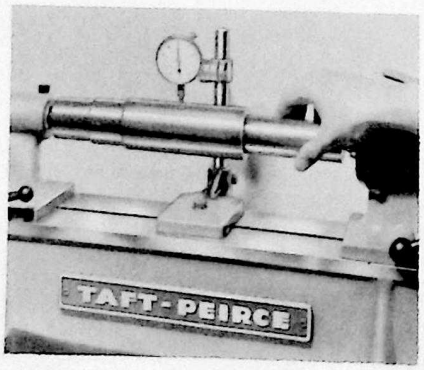


Mounting, Bracket, and .0001" Dial Indicator are useful Bench Center accessories available at slight extra cost.

SPECIFICATIONS

Bench Center Beds are made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. The top surface and edges are precision ground flat and square within limits listed on the opposite page. *Head and Tailstocks* are close-grained cast iron, each equipped with a hardened and ground ¾" x 60° male center. They are machined in pairs with center axes held alike for height within .0005". *Indicator Mounting:* base 3¼" x 7", vertical post 6⅞" x ¾" dia. *Indicator Bracket:* arm 9½" x ⅜" dia. with integral clamp designed to accommodate any standard lug back dial indicator. Bracket includes universal clamp for attaching to mounting post. *Dial Indicator:* AGD Group 2 fitted with lug back, diameter 2 3/16", graduation .0001", range .025", dial reading 0-5-10.

Standard Bench Centers are supplied complete with ground bed, headstock, tailstock, and centers. Mounting, Bracket, and Indicator furnished at slight additional cost.



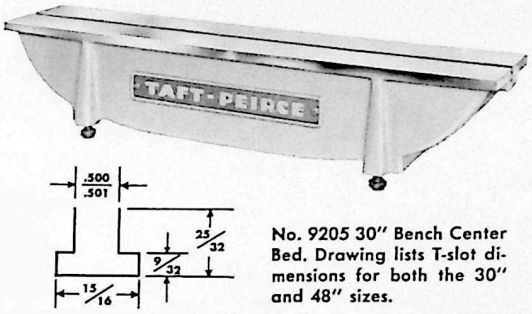
Rotating work against dial indicator to determine runout.

Style No.	Overall Dimensions			Max. Work Capacity		Approx. Weight
	Length	Width	Height*	Between Centers	Diameter	
9205	30"	5½"	11½"	18"	8"	108 lbs.
9205	48"	5½"	12"	36"	8"	170 lbs.

*Without Indicator Mounting and Bracket, and without adjustable buttons.

PARTS, ATTACHMENTS, AND ACCESSORIES
FOR NO. 9205 STANDARD BENCH CENTERS

BEDS: Standard 30″ x 5½″ and 48″ x 5½″ Bench Center Beds listed on the opposite page may be purchased separately for general shop use. Both sizes are provided with precision ground top and sides, central T-slots, and four leveling buttons. Special beds, similar in design to the 30″ and 48″ sizes, are manufactured to order in lengths up to 80″ to suit customer requirements. Standard or special beds may be ordered with scraped surfaces if desired. With ground finish, the 30″ x 5½″ bed is flat within .0005″ and the 48″ x 5½″ bed within .001″. With scraped finish, the 30″ x 5½″ bed is flat within .00025″ and the 48″ x 5½″ bed within .0005″.



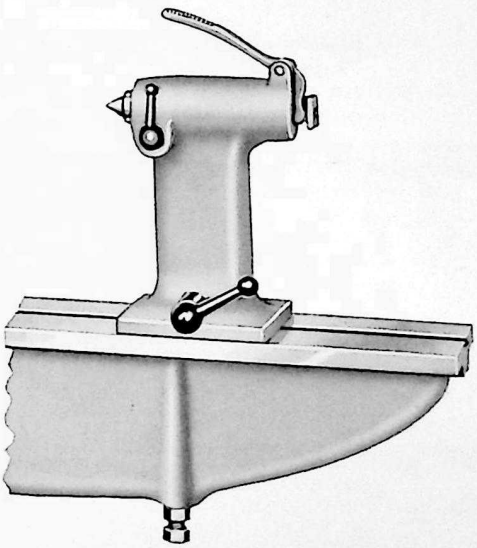
No. 9205 30″ Bench Center Bed. Drawing lists T-slot dimensions for both the 30″ and 48″ sizes.

LARGE CAPACITY HEAD AND TAILSTOCKS are available to order in eight sizes for extending the work handling capacity of standard 8″ x 18″ and 8″ x 36″ Bench Centers listed on the opposite page. These may be ordered as original equipment with No. 9205 Bench Centers or separately for Bench Centers already in use. In ordering, be sure that the weight of work to be swung does not exceed the rated weight capacities listed in the table below. Special Head and Tailstocks are supplied complete with ¾″ x 60° male centers, ½″ keys, T-bolts, and locking levers. Tailstocks are equipped with retracting levers.

Maximum Work Capacity			Maximum Weight Capacity Between Centers
Diameter	Distance Between Centers When Mounted On		
	30″ Bed	48″ Bed	
10″	16″	34″	400 lbs.
12″	16″	34″	375 lbs.
15″	16″	34″	300 lbs.
16″	16″	34″	300 lbs.
20″	16″	34″	250 lbs.
24″	14″	32″	225 lbs.
28″	14″	32″	200 lbs.
32″	14″	32″	200 lbs.

NOTE: 1. Riser Blocks are made to order for any Taft-Peirce head and tailstocks.

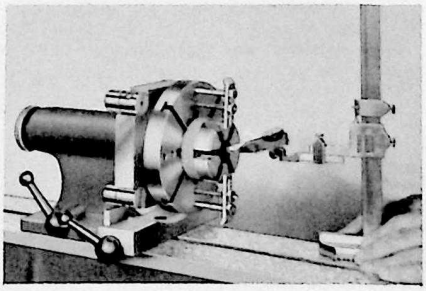
2. Special Indicator Mountings and Brackets supplied to order for use with above.



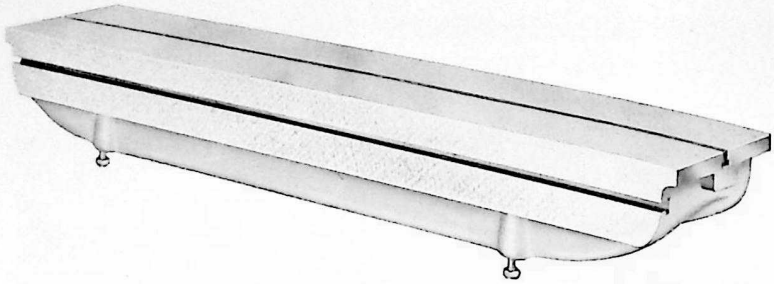
15″ tailstock mounted on a Standard Bench Center Bed.

SPECIAL CENTERS: All Taft-Peirce Head and Tailstocks can be supplied to order with female centers or bull centers as required. Special centers may also be ordered singly or in pairs for Taft-Peirce Bench Centers already in use.

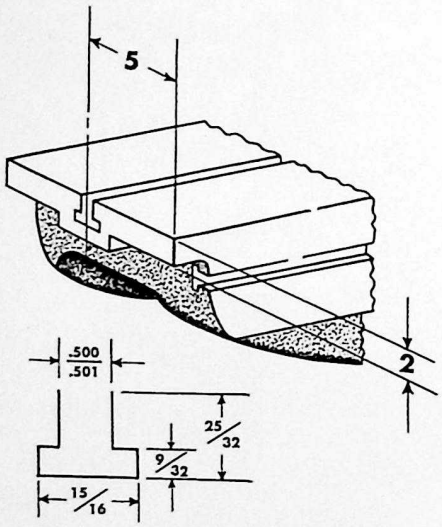
No. 9205-SB SINE BAR INDEXING HEAD: By substituting this special headstock with sine bar indexing plate for the standard 8″ capacity headstock, the Taft-Peirce Bench Center becomes a highly precise dividing fixture suitable for indexing to the limits of accuracy obtainable with a 3″ sine bar. The headstock consists of a square, rotatable face plate, hardened and ground all over, on which are mounted four identical sine rolls, all concentric with the spindle center and equidistant from each other on a 3″ radius. A reference bar, the top surface of which is located 3.2500″ below the spindle center, is clamped firmly to the bed, and from this an accurate setting of the sine plate may be made by means of gage blocks for whatever index angle is desired. Because of the high precision with which this indexing plate must be made and set, it should be fitted to the bench center at the factory, and bench centers so equipped should be used for indexing purposes only.



Checking the accuracy of a female spline gage mounted on Sine Bar Indexing Head by means of auxiliary circular face plate. Gage Blocks placed on the base reference bar provide a highly accurate means of setting any desired index angle.



HEAVY DUTY BENCH CENTER BED
NO. 9209



Built to surface plate accuracy, this rugged Bench Center Bed may be equipped with special heavy duty head and tailstocks or other measuring and inspecting devices. It is rigidly constructed with internal ribbing, and features a side pad for mounting accessory slides and special tooling. Both the side pad and the top are provided with a T-slot for fast aligning and clamping of inspection equipment. The bed includes four adjustable buttons for positive leveling.

SPECIFICATIONS

No. 9209 Heavy Duty Bench Center Bed is made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. The top surface and side pad are scraped square within .0003″ in 6″, averaging 18 bearing points per square inch. All bearing points lie between two reference planes separated by no more than .0003″, and, in addition, the bearing points of any square foot of surface do not vary more than .0001″ from the bearing points of any adjacent square foot. T-slots are straight and parallel to the intersection of the top surface and side pad within .0003″.

Style No.	Overall Dimensions			Width Side Pad	Approx. Weight
	Length	Width	Height*		
9209	52″	10″	6¾″	4″	250 lbs.

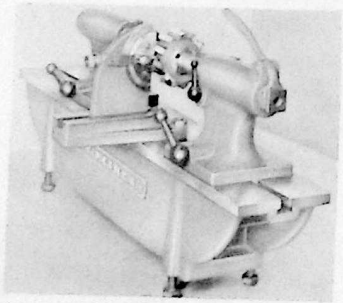
*Without leveling buttons

NOTE: Also available with ground finish

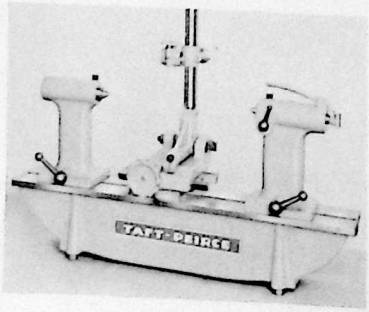
SPECIAL BENCH CENTERS

Taft-Peirce offers years of experience in the design and manufacture of Bench Centers for solving special problems of gaging work held between centers. Engineering and manufacturing facilities are available for designing and producing special purpose bench centers as well as auxiliary slides and accessory tooling. Extra large capacity bench centers are regularly furnished from standard patterns kept in stock. Requests for information should include maximum diameter, length, weight of work to be swung, and, if possible, a drawing or sketch. Surface plates (pages 24 and 25) can also be furnished with provision for Bench Center Head and Tailstocks.

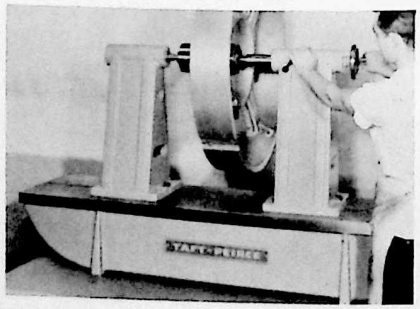
Checking radial rake angle of resharpened cutter using a standard bench center equipped with a special slide and protractor.



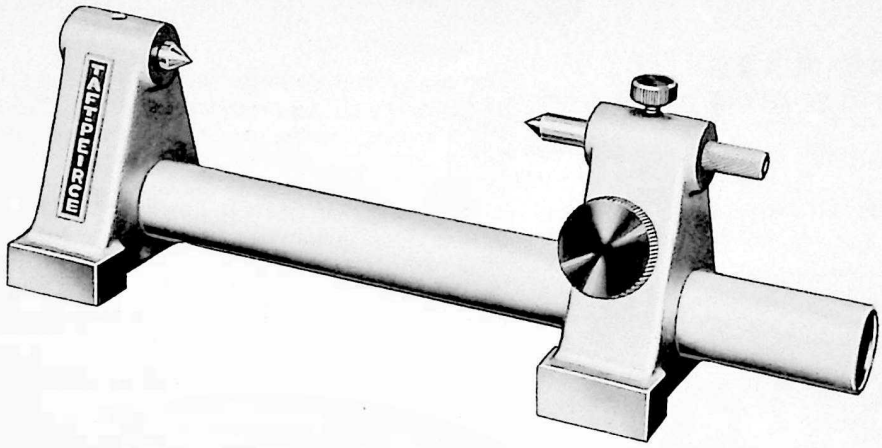
Standard bench center bed with 15″ head and tailstock and holding fixture for fine adjustment of special indicating device.



Mounting a jet engine service part on a custom designed, large capacity bench center. Requirements for oversize bench centers can, in many cases, be met from stock patterns.



INSTRUMENT BENCH CENTER
NO. 9205M



The Instrument Bench Center is specifically designed for speed, accuracy, and versatility in checking miniature and sub-miniature parts machined on centers. When placed horizontally on a surface plate of known flatness, the centers line up automatically within close limits, and a quick turn of a knurled knob locks them in position. The entire unit may then be turned up on end to check runout and squareness of shoulders and sides of grooves.

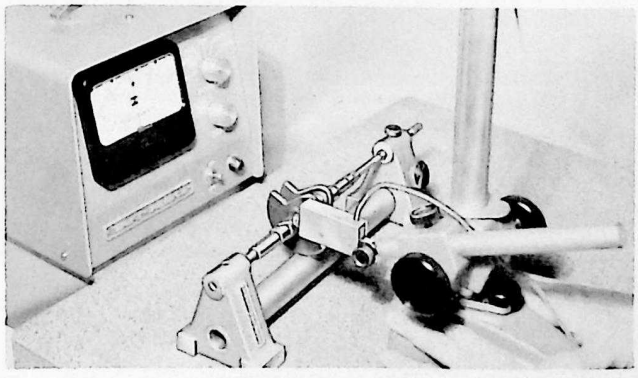
An unusual feature of the No. 9205M is an adjustable headstock center point that may be rotated to bring the workpiece centers perfectly parallel to the surface plate. This allows the inspector to obtain a precise reading of concentricity and parallelism in a horizontal plane, and shoulder runout in a vertical plane.

SPECIFICATIONS

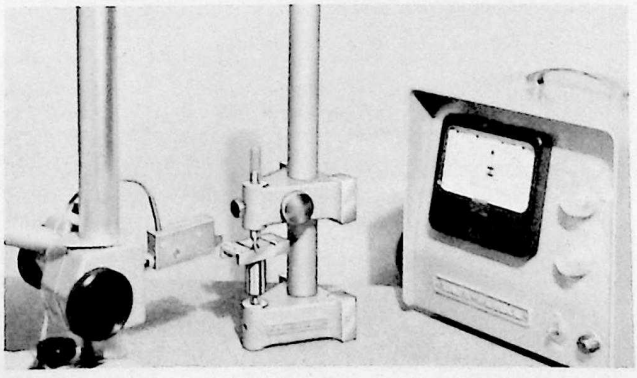
The headstock and tailstock are made of close grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. They are machined for precise alignment of the ⅜" x 60° hardened and ground tool steel centers. The aligning shaft is made of tubular steel, 1⅛" O.D., and is chrome plated for resistance to rust and wear. Finished wood case with hinged cover available upon request.

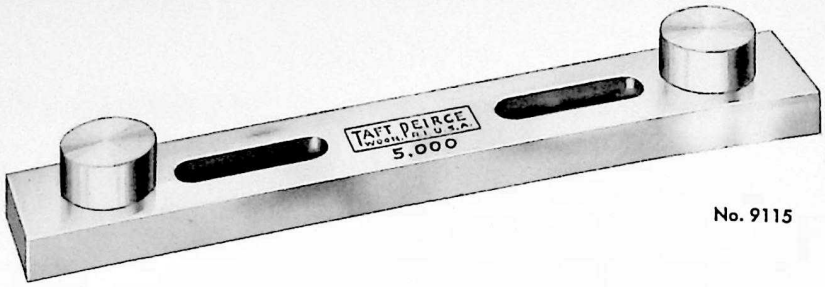
Style No.	Overall Dimensions			Max. Work Capacity		Approx. Weight
	Length	Width	Height	Between Centers	Diameter	
9205M	12¼"	3½"	3⅝"	8"	3"	6¼ lbs.

Checking concentricity of miniature crankshaft after O.D. grinding operation, using the Taft-Peirce Versachek Electronic Gage.



To indicate face runout, stand the Instrument Bench Center vertically on precision ground headstock pads. Surface plate is Taft-Peirce No. 9213.

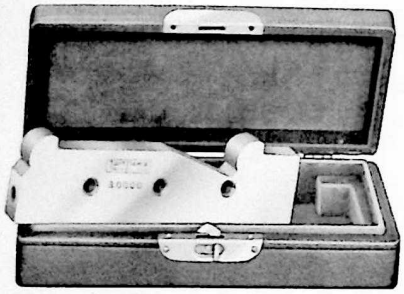




No. 9115

SINE BARS
NO. 9114-17 SERIES

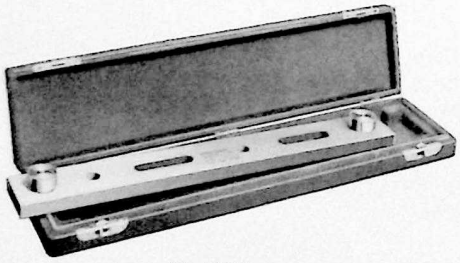
For many years, Taft-Peirce Sine Bars have been specified by industry as the accepted standard for angular inspection. Used in conjunction with Taft-Peirce Surface Plates, Angle Irons, and Gage Blocks, Sine Bars permit extremely accurate setting of acute angles based on simple shop trigonometry. The accuracy of the sine bar method is assured by adherence to the close tolerances listed below for bar flatness, squareness, and parallelism, as well as sine button alikeness and location. For extreme accuracy, it is recommended that the longest sine bar applicable be used.



No. 9114

SPECIFICATIONS

Taft-Peirce Sine Bars are made of high quality alloy steel, scientifically heat treated for maximum stability and wear resistance. The bars are precision ground and the sine buttons cylindrically lapped to limits listed in the tolerance table below. 5″, 10″, and 20″ Sine Bars are constructed with the sine buttons located on one face of the bar, while the 3″ size has integral buttons located on one edge. The 3″ Sine Bar is stocked in Commercial Class tolerance only, while the 5″ and 10″ Sine Bars are stocked in both Commercial and Laboratory Class. The 20″ Sine Bar is made to order. All sizes are furnished in a lined leatherette case with snap lock.



No. 9116

Style No.	Overall Dimensions			Center Distance of Sine Buttons	Approx. Weight
	Length	Width	Thickness		
9114	4″	$1\frac{11}{16}$″	$\frac{3}{8}$″	3″	1 lb.
9115	$6\frac{1}{2}$″	1″	$\frac{3}{8}$″	5″	1 lb.
9116	$11\frac{1}{2}$″	$1\frac{3}{8}$″	$\frac{3}{8}$″	10″	2 lbs.
9117	22″	$1\frac{7}{8}$″	$\frac{1}{2}$″	20″	7 lbs.

NOTE: 1. See opposite page for basic information on how to set up sine angle equipment. Setting constants and multipliers are available in Bulletin #815 @ $1.00.

2. For convenience in attaching to angle irons or other shop fixtures, Taft-Peirce Sine Bars have mounting holes and slots as follows:

No. 9114 — Three 10-32 through holes and one 10-32 hole in each end.

No. 9115 — Two slots $1\frac{1}{4}$″ long x $1\frac{1}{32}$″ wide.

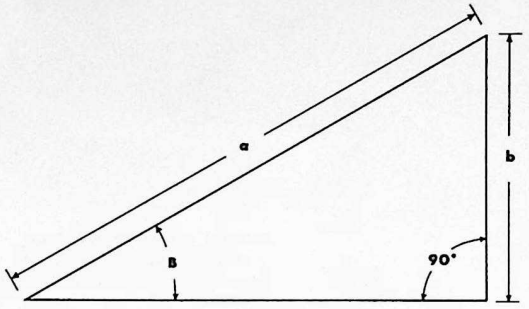
No. 9116 — Two slots $1\frac{23}{32}$″ long x $1\frac{1}{32}$″ wide and two $1\frac{1}{32}$″ diameter holes.

No. 9117 — Four slots $2\frac{13}{32}$″ long x $\frac{13}{32}$″ wide and three $\frac{13}{32}$″ diameter holes.

TOLERANCES: Taft-Peirce Sine Bars

Size (center distance)	Working Surface	Sine Buttons		
	Flat, square with sides and parallel within	Alike, round, and straight within	Parallel with each other and with working surface within	Located at nominal center distance within plus or minus
COMMERCIAL CLASS				
5″	.00010″	.00005″	.00010″	.0002″
10″	.00015″	.00005″	.00015″	.0003″
20″	.00020″	.00006″	.00020″	.0004″
LABORATORY CLASS				
5″	.000050″	.00003″	.000050″	.00010″
10″	.000075″	.00003″	.000075″	.00015″
20″	.000100″	.00004″	.000100″	.00020″

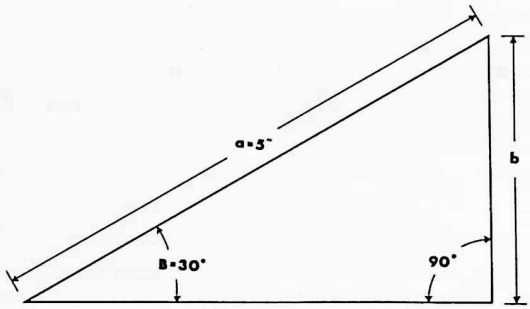
HOW TO SET UP SINE ANGLE EQUIPMENT



1. Setting a sine bar, sine block, sine angle plate or chuck to a given angle is based on solving the shop formula for finding the acute angle "B" of a right triangle:

The sine of an angle equals the side opposite divided by the hypotenuse, or

$$\sin B = \frac{b}{a}$$



2. If you know that angle "B" is 30° and that hypotenuse "a" is 5", the formula is solved by substituting these values in the formula in step 1:

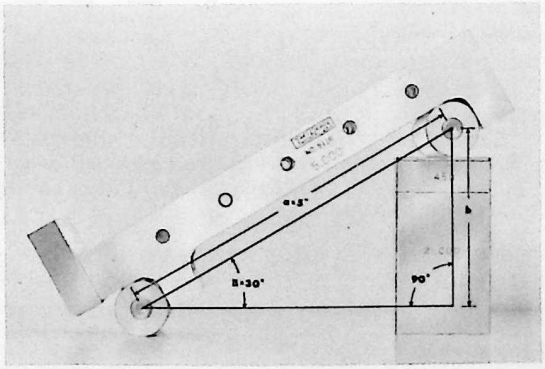
$$\sin 30° = \frac{b}{5}$$

$$b = 5 \times \sin 30°$$

Consulting the table of sines found in most any machinist's handbook, the sine of 30° is found to be .500. Substituting this value in the formula,

$$b = 5 \times .500$$

$$b = 2.500"$$



3. To set any 5" sine angle tool to 30°, a No. 9118-5 Sine Block for example, follow the same procedure as in step 2. The hypotenuse "a" is 5", the fixed distance between sine roll centers, and "b" is the required gage block height combination:

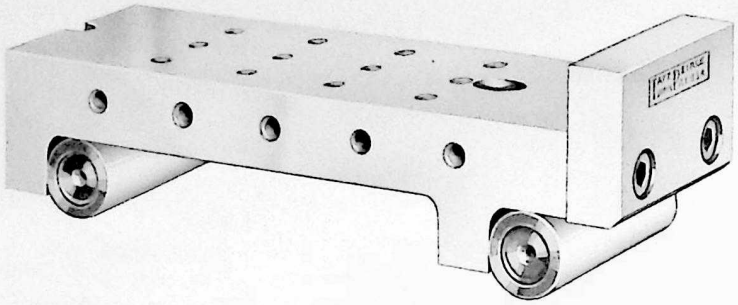
$$\sin 30° = \frac{b}{5} = \frac{\text{proper gage block height combination}}{\text{fixed distance between sine roll centers}}$$

The answer, b = 2.500", indicates the gage block height required to elevate the sine block to a precise 30° angle.

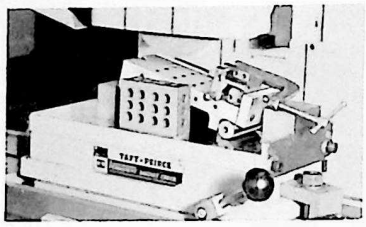
NOTE: Setting constants and multipliers are available in Bulletin #815 @ $1.00.

IMPORTANT: When using sine angle equipment with center distance other than 5", be sure to multiply the constant as follows:

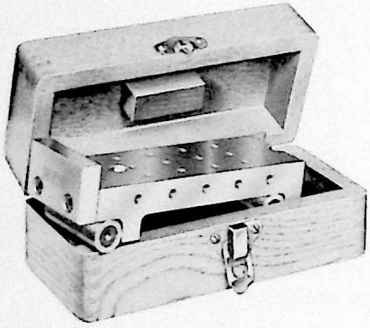
20" Center Distance, Multiply Constant by 4
10" Center Distance, Multiply Constant by 2
7" Center Distance, Multiply Constant by 1.4
3" Center Distance, Multiply Constant by 0.6



SINE BLOCKS
NO. 9118 SERIES



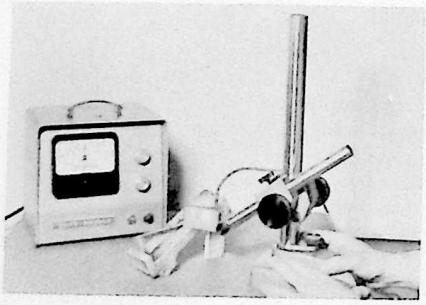
5" Sine Block makes fast set-up for grinding precise angle on end of shaft. V-Block is Taft-Peirce No. 9129.



All Taft-Peirce Sine Blocks are furnished in finished wood cases for safe, convenient storage.

Taft-Peirce Sine Blocks have been favorites with toolmakers for many years. They are heavy duty fixtures for holding work that must be set to precise angles for layout, light machining, or inspection. Each block is equipped with a precision ground end plate that acts as a work-positioning stop, and tapped holes in the top surface and sides are provided to allow a wide variety of work-clamping set-ups.

Checking accuracy of Angle Gage mounted on 5" Sine Block using the Taft-Peirce Versa-chek Electronic Gage.



SPECIFICATIONS

Taft-Peirce Sine Blocks are made of high quality alloy steel, scientifically heat treated for maximum stability and wear resistance. The top working surface is precision ground flat and square with the adjacent sides and parallel to the sine rolls. The tool steel sine rolls are ground and lapped alike for diameter, roundness, and straightness, and are mounted parallel to each other at their nominal center distance within the limits specified below. All Sine Blocks are shipped from stock packed in finished wood cases with hinged covers.

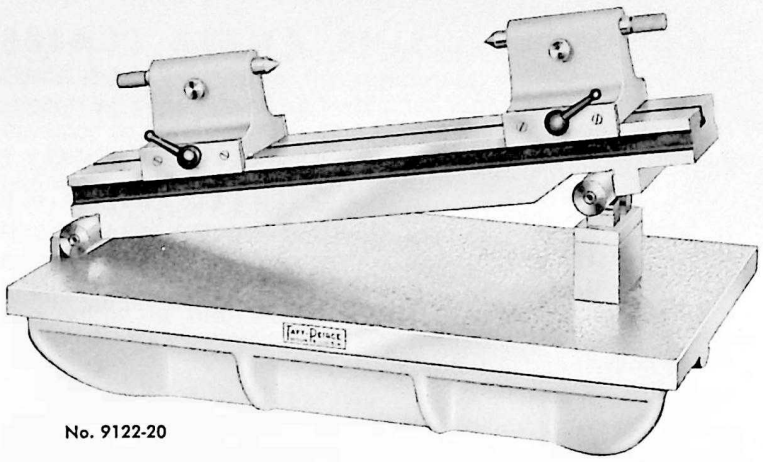
Style No.	Overall Dimensions			Tapped Holes	Center Distance of Sine Rolls	Approx. Weight
	Length	Width	Height			
9118-5	6 13/16"	2 1/8"	1 3/4"	10-32	5"	3 1/2 lbs.
9118-10	11 5/8"	4"	1 19/32"	10-32	10"	10 lbs.
9118-20	22 5/8"	5 1/4"	2 1/2"	1/4-20	20"	53 lbs.

NOTE: See page 7 for basic information on how to set up sine angle equipment. Setting constants and multipliers are availabe in Bulletin #815 @ $1.00.

TOLERANCES: Taft-Peirce Sine Blocks

Size (center distance)	Working Surface	Sine Rolls		
	Flat, square with sides and parallel within	Alike, round, and straight within	Parallel with each other and with working surface within	Located at nominal center distance within plus or minus
5"	.00010"	.00005"	.00010"	.0002"
10"	.00015"	.00005"	.00015"	.0003"
20"	.00020"	.00006"	.00020"	.0004"

NOTE: No. 9118-5 Sine Block is available to Laboratory Tolerances which are one-half of those specified above. Nos. 9118-10 and 9118-20 Sine Blocks are not manufactured to Laboratory Tolerances.



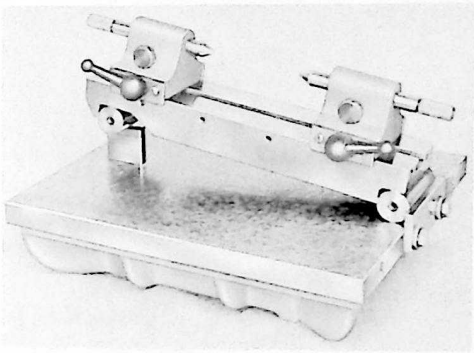
No. 9122-20

SINE BLOCK TAPER TESTING FIXTURES
NO. 9122 SERIES

Sine Block Taper Testing Fixtures are designed especially for precise inspection of tapers machined on centers. Tapered work is mounted between the centers, the Sine Block base elevated by gage blocks to one-half the included angle, and the work is then indicated at both ends to determine the accuracy of taper.

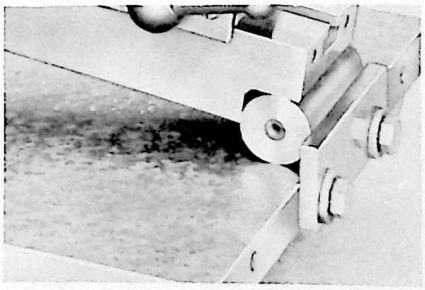
Taper Testing Fixtures combine a special 10″ or 20″ Sine Block with a pair of identical center heads that may be positioned anywhere along a T-slot running the length of the block and locked in place or removed entirely to free the Sine Block for general purpose angle checking. Used in the horizontal plane, a Taper Testing Fixture becomes an extremely accurate Bench Center. The hardened and ground tool steel centers are lapped for precision fit in the heads and may be locked by turning a knurled knob on each center head assembly.

The surface plate supplied with either Sine Block Taper Testing Fixture is No. 9211, hand-scraped cast iron, described on page 24. The 10″ Fixture takes a 10″ x 12″ size, and the 20″ Fixture takes a 14″ x 24″ size. Both surface plates are equipped with an end stop that may be clamped in any one of three positions along one end of the surface plate.



No. 9122-10

For the inspector's convenience, surface plates for Sine Block Taper Testing Fixtures are equipped with a handy three-position end stop.



SPECIFICATIONS

Sine Blocks are made of high quality alloy steel, scientifically heat treated for maximum stability and wear resistance, and precision ground on all working surfaces. Sine rolls are manufactured of tool steel, ground and lapped. Manufacturing tolerances are identical with those for 10″ or 20″ standard Sine Blocks listed on page 8. *Center Heads* are made of seasoned cast iron, machined in pairs for accurate alignment of centers. When mounted on the Sine Block, the centers are parallel to the sine rolls within .0002″ and parallel to the sides of the Sine Block within .0005″.

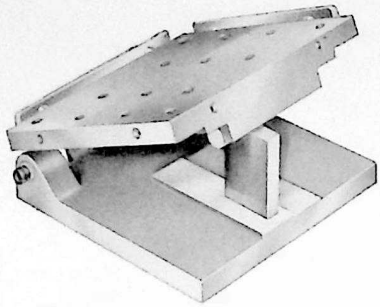
The recommended surface plate will be furnished with each Sine Block Taper Testing Fixture unless otherwise specified.

Style No.	Overall Dimensions			Center Distance of Sine Rolls	Max. Work Capacity		Approx. Weight
	Length	Width	Height		Between Centers	Diameter	
9122-10	12″	2½″	1¾″	10″	7″	3½″	47 lbs.*
9122-20	24 1/16″	4″	2¾″	20″	15″	6″	174 lbs.†

*If No. 9211 10″ x 12″ Surface Plate is not to be included, deduct 35 lbs.

†If No. 9211 14″ x 24″ Surface Plate is not to be included, deduct 105 lbs.

NOTE: See page 7 for basic information on how to set up sine angle equipment. Setting constants and multipliers are available in Bulletin #815 @ $1.00.



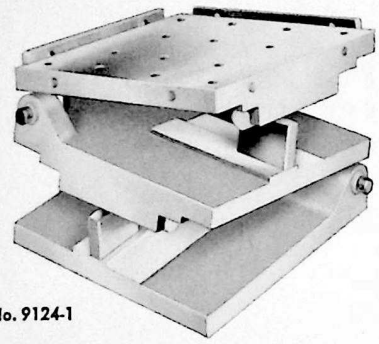
No. 9123-1

SINE ANGLE PLATES

NO. 9123-24 SERIES
NO. 9228-29 SERIES

SINE ANGLE MAGNETIC CHUCKS

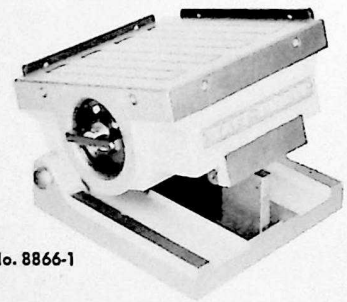
NO. 9866 SERIES
NO. 8866 SERIES



No. 9124-1

Sine Angle Plates save time and trouble in setting work to simple or compound angles for light machining and inspection. Top plates are equipped with end stops for positioning work and tapped holes for use in applying clamps. All locking screws are tightened by turning them toward the setting rolls. A precision ground .100" step on the base plate makes it possible to set small angles down to zero using standard gage blocks.

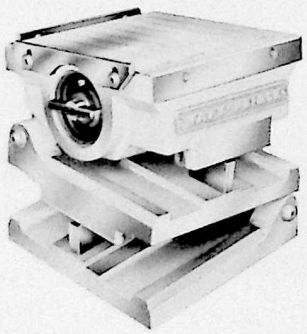
Sine Angle Magnetic Chucks combine the principle of Sine Angle Plate construction with the Taft-Peirce Superpower Magnetic Chuck. They are available in either simple or compound angle types and electromagnetic or permanent magnet models. Angular settings are obtained in the same manner as with Sine Angle Plates, except that work is held by magnetic force instead of by mechanical clamping.



No. 8866-1

SPECIFICATIONS

6" x 6" Sine Angle Plates and 6½" x 12" Sine Angle Plates are made of close-grained cast iron. Both sizes are scientifically heat treated for maximum stability and wear resistance. All Taft-Peirce Sine Angle Plates and Sine Angle Magnetic Chucks are precision ground on working surfaces and feature tool steel sine rolls, hardened and lapped. Specific dimensions and tolerances are listed in the tables below.



No. 8866-2

Style No.	Type	Overall Dimensions			Tapped Holes	Center Distance of Sine Rolls	Approx. Weight
		Length	Width	Approx. Height			
SINE ANGLE PLATES							
9123-1	Simple	6"	6"	2"	¼-20	5"	14 lbs.
9124-1	Compound	6"	6"	3⅜"	¼-20	5"	21 lbs.
9228	Simple	12"	6½"	2⅞"	5/16-18	10"	29 lbs.
9229	Compound	12"	6½"	4¾"	5/16-18	5" & 10"	41 lbs.
SINE ANGLE MAGNETIC CHUCKS							
*8866-1	Simple	6"	6"	3¾"	.....	5"	30 lbs.
*8866-2	Compound	6"	6"	5"		5"	37 lbs.

NOTE: See page 7 for basic information on how to set up sine angle equipment. Setting constants and multipliers are available in Bulletin #815 @ $1.00.

*Permanent Magnet Models

TOLERANCES

Taft-Peirce Sine Angle Plates and Sine Angle Magnetic Chucks

Sine Rolls			
Center Distance		Alike, round, and straight within	Parallel with each other and with working surface within
Nominal	Located within plus or minus		
5"	.00015"	.00005"	.00010"
10"	.00030"	.00005"	.00015"

Working Surface	
Size	Flat, square with sides and parallel within
6" x 6"	.0002"
6½" x 12"	.0003"

TOOLMAKER'S ADJUSTABLE KNEES
NO. 9170 SERIES

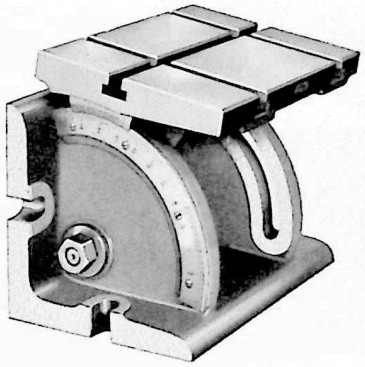
The Taft-Peirce Toolmaker's Adjustable Knee is designed for fast set-up of work for angular layout, machining, and inspection. The heavily constructed right angle base can be clamped to machine tables on either the plain or keyed face or placed on either end as a means of rotating work 90° without unclamping. A tilting work table, provided with handy T-slots, is pivoted at the inner corner of the base and can be swung to any angle from horizontal to vertical and firmly clamped in position. A graduated quadrant and Vernier scale permit rapid and accurate setting of the table to 5 minutes of angular accuracy. For closer setting, the pivoting stud is provided with a ground and lapped extension which acts as the fixed measuring button of a sine bar. The location of the other button is held within a tolerance of .0005″ on the appropriate radius.

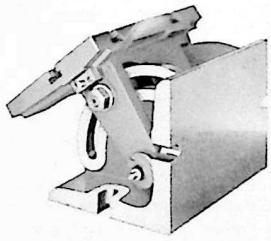
SPECIFICATIONS

The Toolmaker's Adjustable Knee is made of close-grained cast iron. thoroughly seasoned and carefully heat treated for maximum stability. Base surfaces and edges are hand scraped square to within .0003″ in 6″, and the table is precision ground on working face and edges. The 7″ x 10″ size is shipped from stock; 12″ x 18″ and 18″ x 24″ sizes are manufactured to order. Orders should specify both Style Number and table size.

Style No.	Overall Dimensions			Center Distance of Sine Buttons	Approx. Weight
	Length	Width	Height		
9170	10″	7″	9″	5″	66 lbs.
9170	12″	18″	12″	7″	270 lbs.
9170	18″	24″	18″	10″	700 lbs.

NOTE: See page 7 for basic information on how to set up sine angle equipment. Setting constants and multipliers are available in Bulletin #815 @ $1.00.

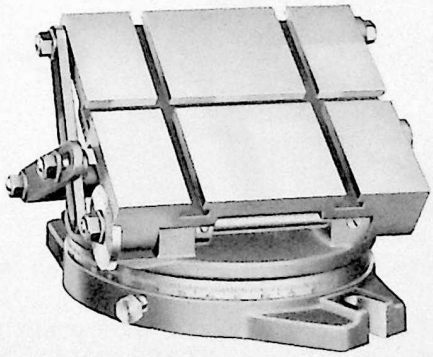




Above view of No. 9170 7″ x 10″ shows position of quadrant and Vernier scale. View to the right shows location of sine buttons.

ADJUSTABLE ANGLE PLATES
NO. 9175 SERIES

Taft-Peirce Adjustable Angle Plates provide a rapid, convenient means of setting up angular work for machining operations. Ruggedly constructed throughout, they comprise a tilting table mounted on a swivel base which enables the operator to set up quickly for machining compound angles. The keyed base is graduated a full 180°, reading 90°—0—90°, and may be locked at any desired setting. The tilting table, provided with work-mounting T-slots, is set for ordinary purposes by means of a built-in protractor, graduated in 5° increments, which swings from 0 to 90° and locks in any position. If extreme setting accuracy is required, the tilting table may be set to a sine bar or sine block according to the basic procedure described on page 7.

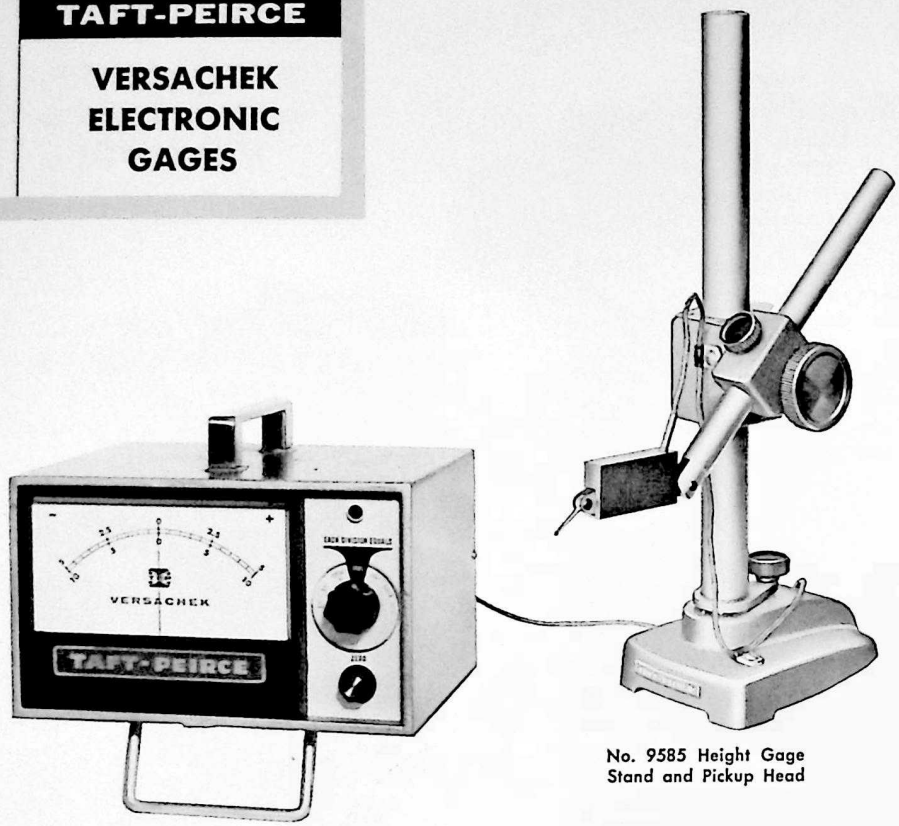


SPECIFICATIONS

Adjustable Angle Plates are made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability, and precision ground on the bottom, table surface, and edges. Orders should specify both Style Number and table size. 8″ x 10″ and 12″ x 18″ sizes are shipped from stock; the 18″ x 24″ size is manufactured to special order.

Style No.	Overall Dimensions			Approx. Weight
	Length*	Width*	Height	
9175	10″	8″	5″	77 lbs.
9175	18″	12″	6¼″	267 lbs.
9175	24″	18″	8″	690 lbs.

*Table dimensions

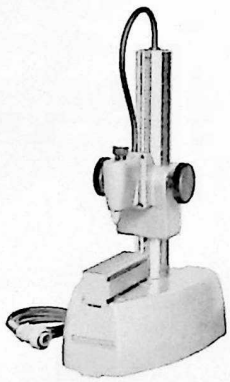


No. 9585 Height Gage Stand and Pickup Head

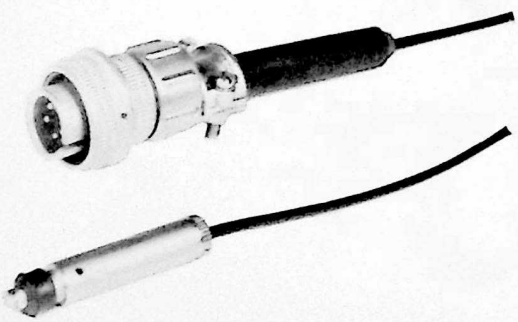
VERSACHEK ELECTRONIC GAGE

The Versachek Electronic Amplifier and Height Gage provide a new standard of accuracy for inspection work done on surface plates. Size variations to a small fraction of .0001" are quickly detected by a frictionless pickup head mounted on a height gage stand and magnified by the Versachek Amplifier to be read on a large meter with widely spaced graduations.

The pickup head operates on a true displacement principle, independent of contact point angle or length, and high or low contact pressure can be selected to suit the type of work being inspected. In addition, contact pressure is reversible. Coarse positioning and quick release of the pickup head bracket is facilitated by a unique leaf spring arrangement on the height gage column clamp which also prevents slipping before tightening of positive locking knobs. A fine adjustment screw at the base is used for final positioning.



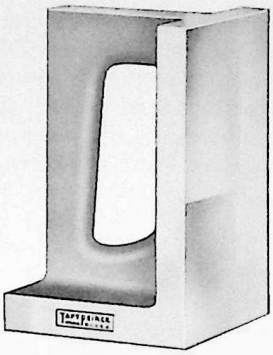
The Versachek Amplifier can also be used with the No. 9580 Comparator Stand (right) and for operating accessory size indicating, recording, and sorting equipment. For complete application data, contact your Taft-Peirce Representative, or write direct to the plant.

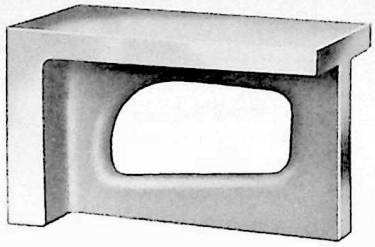


No. 9584 Electronic Capsule furnished with AN type connector.

Use of the Versachek Capsule greatly expands the applications and makes the advantages of electronic gaging available with almost any gaging fixture. This universal pick up, only $\frac{3}{8}$" in diameter and 2" long, is designed to fit where dial indicators have been used. The Versachek Capsule is chrome plated, and sealed against contamination. It is furnished with a removable 4-48 threaded shank $\frac{3}{16}$" spherical radius T.C. contact point.

Versachek Magnification	Value, Each Graduation	Total Scale Range
400:1	.0005"	.010"
2,000:1	.0001"	.002"
4,000:1	.00005"	.001"
20,000:1	.00001"	.0002"





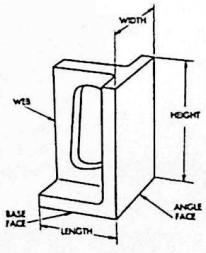
UNIVERSAL RIGHT ANGLE IRONS
NO. 9191-94 SERIES

Because of the accurate squareness and parallelism of the Taft-Peirce Universal Right Angle Iron, work can be clamped to any face and the angle iron placed in any one of a number of positions, so that measurements may be made without relocating. The web in the center permits the angle iron to be set on any side or end, thereby providing a useful reference block for measuring and indicating large work. The larger sizes are ideally suited for use as reference surfaces in locating, setting up and machining large castings on planers and boring mills.

Two No. 9194 Universal Right Angle Irons used for locating large casting on planer table.

SPECIFICATIONS

Universal Right Angle Irons are made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. Faces, sides, and ends are ground square and parallel to within .0002" on Nos. 9191-92-93, and .0003" on No. 9194. Overall dimensions are held to approximate size only.

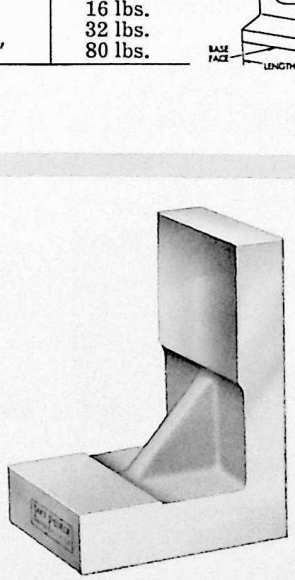


Style No.	Overall Dimensions			Approx. Thickness			Approx. Weight
	Length	Width	Height	Base Face	Angle Face	Web	
9191	4"	3¾"	5"	¾"	⅝"	⅝"	7 lbs.
9192	5"	4½"	8"	1"	¾"	¾"	16 lbs.
9193	7"	5½"	10"	1⅛"	1"	⅞"	32 lbs.
9194	9"	8"	16"	1⅜"	1⅛"	15/16"	80 lbs.

For additional data, see page 28, notes 1, 2, 3, 5, and 7.

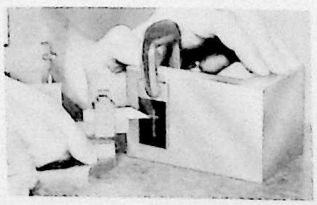
TOOLMAKER'S KNEE
NO. 9180

The Taft-Peirce Toolmaker's Knee will be found useful for mounting small work during inspection and layout operations. It is also frequently used as a base element in simple jigs or fixtures, or for holding work on a surface grinder. Pads are finished on the back of each angle for clamping and reference purposes.



SPECIFICATIONS

The Toolmaker's Knee is made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability, with all finished surfaces ground square and parallel to each other within .0001".

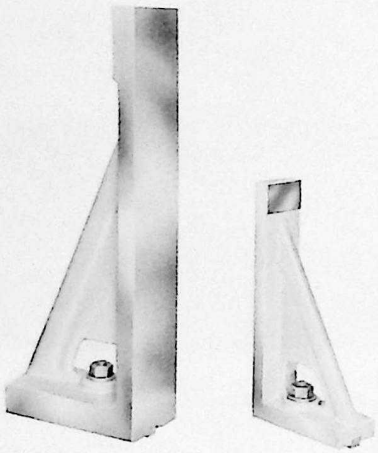


Precisely square and parallel, the Toolmaker's Knee may be used on any face or edge for layout, inspection, and machining.

Style No.	Overall Dimensions			Pad Dimensions		Approx. Weight
	Length	Width	Height	Table Face	Angle Face	
9180	3"	2½"	4"	1" x 2½" x ¾" thick	1⅞" x 2½" x 11/16" thick	4 lbs.

For additional data, see page 28, notes 1, 2, 3, 5, 7.

MEASURING IRONS
NO. 9201-02 SERIES



The Measuring Iron, as its name suggests, is used primarily as a fixed vertical reference surface from which work locating and machining measurements can be conveniently taken. Provided with standard removable keys and T-bolt, it can be quickly aligned with machine table slots and clamped in position. Machinists and toolmakers find the Measuring Iron a valuable accessory for precision boring operations. When clamped adjacent to work mounted on the machine table, with its vertical face parallel to a test plug in the spindle, it provides a positive means of measuring the location of the table or work. The narrow width of the Measuring Iron offers a convenient means of clamping work for machining, especially where table room is at a minimum. No. 9202 Measuring Iron is especially recommended for this use.

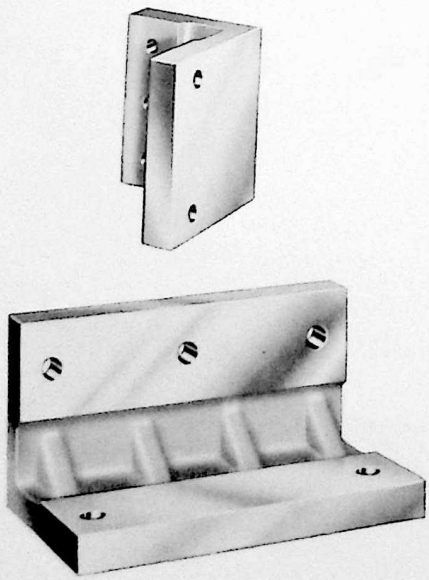
SPECIFICATIONS

Measuring Irons are made of close grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. The vertical face is finished square to the bottom face to within .0002″ per foot, with edges ground for finish only. The inside pad is parallel to the vertical face within .0002″ on No. 9201 and .0003″ on No. 9202. The key slot on both sizes is machined square with the vertical face within .0002″. The following sizes are carried in stock, each furnished with two precision aligning keys and one T-bolt with nut.

Style No.	Overall Dimensions			Pad Dimensions	Base Thickness, Approx.	Approx. Weight
	Length	Width	Height			
9201	6″	2½″	12½″	1½″ x 2½″ x 13/16″ thick	⅞″	13 lbs.
9202	8″	4″	21½″	3½″ x 4″ x 1 5/16″ thick	1⅝″	45 lbs.

For additional data, see page 28, notes 1, 5, and 7.

DUPLEX ANGLE IRONS
NO. 9181 SERIES



Duplex Angle Irons are highly accurate, general purpose work holding fixtures for layout, machining, and inspection use. Ground inner pads provide handy reference surfaces to increase the speed and accuracy of set-up work, and conveniently spaced holes in both faces may be used for clamping work to the angle iron or bolting the angle iron to machine tables. Heavy ribbing in the inside corner of each size assures maximum strength and rigidity.

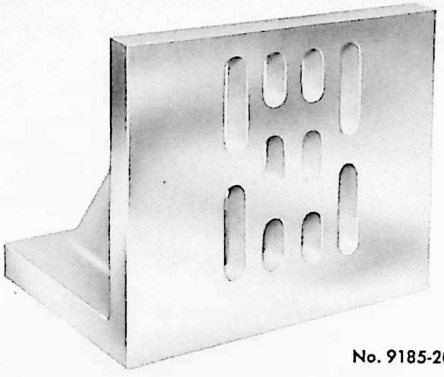
SPECIFICATIONS

Duplex Angle Irons are made of close grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. Outer working faces are finish ground square to within .0005″ in 6″; inner pads are parallel to their respective outer faces within .0005″. Overall dimensions are held to approximate size only.

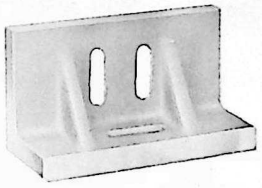
Style No.	Overall Dimensions			Pad Dimensions	Diameter Clamping Holes	Approx. Weight
	Length	Width	Height			
9181-10	5″	6″	5″	2¼″ x 6″ x 1⅛″ thick	17/32″	15 lbs.
9181-20	6″	12″	6″	3″ x 12″ x 1⅛″ thick	21/32″	36 lbs.

For additional data, see page 28, notes 1, 2, 3, 5, and 7

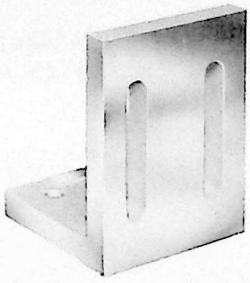
SLOTTED ANGLE IRONS
NO. 9185 SERIES



No. 9185-20



No. 9185-14

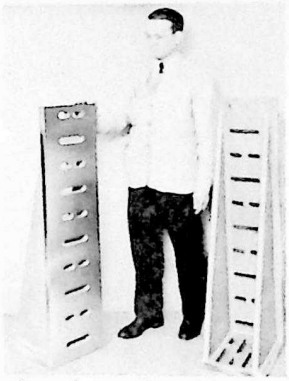


No. 9185-12

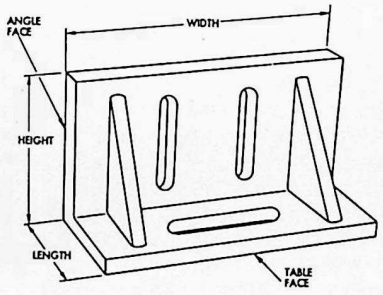
Taft-Peirce Slotted Angle Irons are stocked in eight popular sizes for use on every machine from the smallest miller to the largest boring mill. Equally useful on machine table or surface plate, they are heavily proportioned and ribbed for strength and rigidity. Table faces and angle faces have convenient clamping holes and slots for fast work mounting and machine set-up. Many shops use these versatile Angle Irons as bases for building permanent work fixtures.

SPECIFICATIONS

Slotted Angle Irons are made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability, with faces and edges precision ground square to within .0005" in 6". Overall dimensions are held to approximate size only.



Extra large Slotted Angle Irons like these are regularly manufactured to meet special customer requirements.



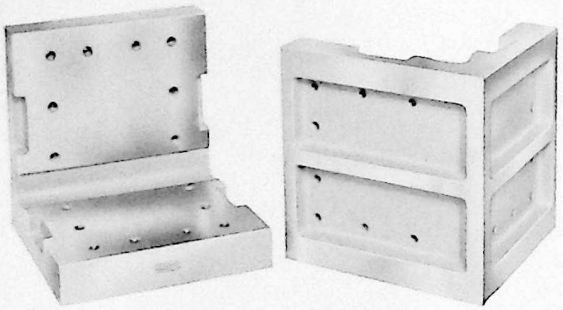
Style No.	Overall Dimensions			Approx. Face Thickness	Approx. Weight
	Length	Width	Height		
9185-10	4"	5"	5½"	¾"	8 lbs.
9185-12	6"	6"	8"	⅞"	20 lbs.
9185-14	4"	9"	5"	⅞"	16 lbs.
9185-16	8"	10"	12"	1⅛"	54 lbs.
9185-18	5"	12"	6"	1"	30 lbs.
9185-20	9"	12"	10"	1⅛"	67 lbs.
9185-22	12"	16"	14"	1⅛"	150 lbs.
9185-26	16"	20"	18"	1⅛"	220 lbs.

For additional data, see page 28, notes 1, 2, 3, 5, and 7

APPROXIMATE DIMENSIONS — CLAMPING HOLES AND SLOTS

Style No.	Table Face Holes		Table Face Slots		Angle Face Slots	
	Number	Diameter	Number	Length x Width	Number	Length x Width
9185-10	2	11/16"	.....	.....	2	3" x 1 1/16"
9185-12	4	¾"	.....	.....	2	4⅞" x ¾"
9185-14	.....	.....	1	2½" x ¾"	2	2⅜" x ¾"
9185-16	.....	.....	3	3¾" x ¾"	4	3⅝" x ¾"
9185-18	.....	.....	3	2⅞" x ¾"	2	5⅜" x ¾"
9185-20	.....	.....	2	5⅛" x ¾"	4	3⅛" x ¾"
			4	2⅛" x ¾"	6	1¾" x ¾"
9185-22	.....	.....	3	4¼" x 1"	2	8" x 1"
			3	2¾" x 1"	4	3½" x 1"
9185-26	12	1"	.....	.....	3	11" x 1"
					4	4⅞" x 1"

PALLET IRONS
NO. 9183 SERIES



Taft-Peirce Pallet Irons are all-purpose work holding fixtures that provide a rugged right-angle base on which work can be located and clamped to travel through multiple operations. Held to close tolerances for squareness, parallelism, and base-to-face height, they are ideally suited for accurate work positioning in several planes.

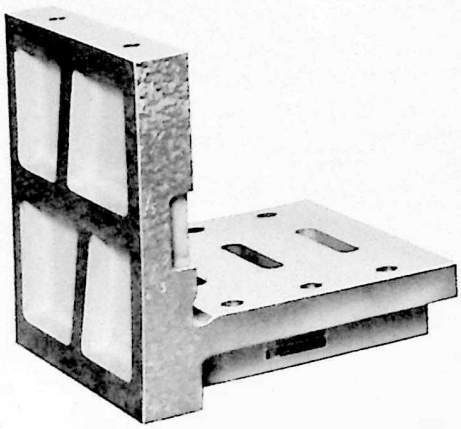
Pallet Irons have tapped holes for convenient work holding and recessed ledges for clamping to machine tables. In addition, the intersection of the inside faces is relieved for convenience in mounting right angle work. Locating pins or stops, as well as keyways and work clamping devices, may be added to any working surface, making Pallet Irons ideal for small lot machining or for use on multi-station transfer lines.

SPECIFICATIONS

Pallet Irons are made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. Inside and outside surfaces are precision ground and held parallel within .0003″ on the 8″ size and .0004″ on the 10″ size. Adjacent sides are square within .0005″ in 6″, overall dimensions are held to plus or minus .005″, and the thickness of angle faces to plus or minus .0005″.

Style No.	Overall Dimensions			Tapped Holes	Inside Working Surfaces	Approx. Weight
	Length	Width	Height			
9183-8	8″	8″	8″	⅜—16	5½″ x 8″ x 1½″ thick	27 lbs.
9183-10	10″	10″	10″	⅜—16	7″ x 10″ x 1¾″ thick	51 lbs.

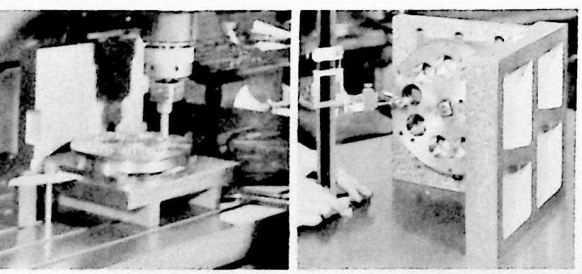
For additional data, see page 28, notes 1, 2, 3, 6, and 7.



MULTIPLEX ANGLE IRON
NO. 9182-12

The Taft-Peirce Multiplex Angle Iron is a ruggedly constructed work holding fixture that eliminates multiple work set-ups in machining and inspection. It is a particularly useful accessory for boring mills, planers, and radial drills. Both base and angle faces are strongly ribbed for rigidity, and the intersection of the two inner faces is relieved for convenience in handling right angle work. Two tapped holes at the end of each face are provided for the insertion of eye bolts for easy hoisting. Two recessed ledges in the base section facilitate clamping of the Multiplex to machine or inspection tables.

Typical Multiplex Angle Iron transfer application — squareness of hole bored on machine (left) is checked on surface plate (right) without breaking the work set-up.



SPECIFICATIONS

The Multiplex Angle Iron is made of close grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability, with all finished surfaces hand scraped square to within .0005″ in 6″ and parallel within .0005″. Overall dimensions are held to approximate size only. The angle face has four ¾″ diameter holes and three slots, $^{13}/_{16}$″ wide x 4¼″ long, for insertion of clamping bolts.

Style No.	Overall Dimensions			Inside Working Surfaces		Approx. Weight
	Length	Width	Height	Table Face	Angle Face	
9182-12	12″	12″	12″	9″ x 12″ x 2″ thick	10″ x 12″ x 3″ thick	95 lbs.

For additional data, see page 28, notes 1 and 7.

BOX ANGLE IRON
NO. 9166-6

One of the most versatile tools in the shop, the Box Angle Iron is ideally suited for layout and inspection, for machine set-ups involving work of large size or complex design, and as an aid to machining small parts. Its unique construction combines the advantages of a right angle iron and box parallel in a single unit. The open sides vastly simplify clamping and also provide clearances for nesting work projections such as bosses and pads. Many shops take advantage of these design features by converting Box Angle Irons into special fixtures by incorporating plain or tapped holes, key slots, locating pins, and stops. Due to the close size tolerances to which Box Angle Irons are manufactured, they are frequently combined for use as parallels.

SPECIFICATIONS

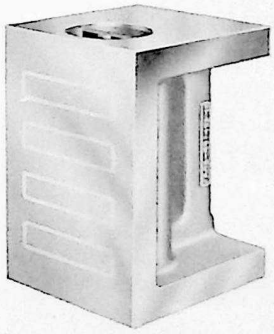
Box Angle Irons are made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. All finished surfaces are precision ground with overall dimensions held to size within plus or minus .0005″, opposite sides parallel within .00025″, and adjacent sides square within .0005″.

Style No.	Overall Dimensions			Square Openings, Approx.	Rectangular Openings, Approx.	Approx. Weight
	Length	Width	Height			
9166-6	6″	6″	6″	4″ x 4″	1⅞″ x 4″	30 lbs.

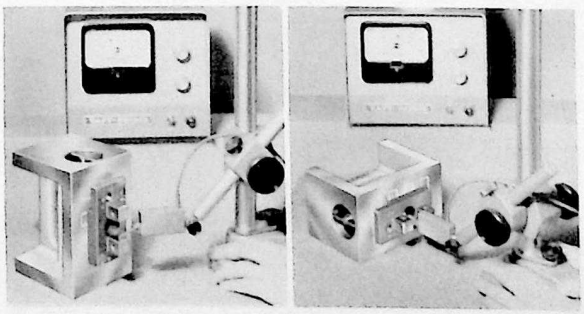
For additional data, see page 28, notes 1, 2, 3, 6, and 7.

MAGNETIC ANGLE IRON
NO. 9195

The Magnetic Angle Iron is an ingenious layout and inspection tool that combines the advantages of a Universal Right Angle Iron with a magnetic chuck and eliminates the lost time and inconvenience of work clamping. The magnetic face can be quickly energized by a simple 90° turn of the recessed control bar, one of which is located on each end face, and the work can then be held firmly in place for measuring, scribing, or indicating. By turning the control bar through a small portion of its span, the face can be slightly magnetized, so that the work may be easily adjusted by hand to final location before full holding power is applied. The Magnetic Angle Iron can then be turned on its side, back, or ends for checking the work in different positions with reference to a surface plate. The heavy supporting rib between the end faces gives the Magnetic Angle Iron great structural strength and acts as a convenient carrying handle.



A single set-up on the Magnetic Angle Iron allows a precision ordnance gage to be completely checked for parallelism and squareness. Inspector is using the Versachek Electronic Gage.

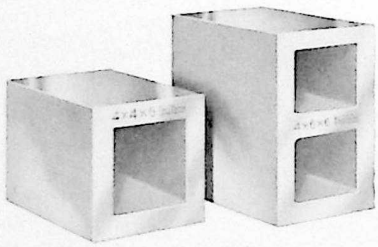


SPECIFICATIONS

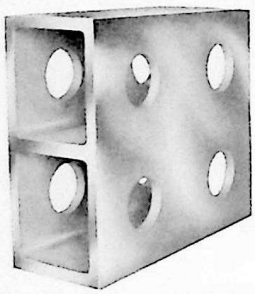
The Magnetic Angle Iron is made of a special analysis iron casting thoroughly seasoned and carefully heat treated for maximum stability. It contains a rotary magnetic pack which is turned on or off by either of the control bars recessed into the end faces of the casting. Faces, sides, and ends are precision ground square and parallel within .0002″.

Style No.	Overall Dimensions			Approx. Weight
	Length	Width	Height	
9195	4¾″	4¼″	6½″	18 lbs.

BOX PARALLELS
NO. 9160-64 SERIES



No. 9160 No. 9161



For easy application of clamps or bolts, No. 9163 Box Parallel has four 3" diameter cored holes through each 16" x 14" face.

Box parallels are widely used in machine shops for set-up and machining operations, and for mounting work to be laid out, scribed, and inspected. Box parallels are cored to reduce weight and to provide convenient ledges for applying clamps. They may be drilled, tapped, slotted, or otherwise machined for making special fixtures. Two or more Box Parallels of a given size may be used as a set, as they are manufactured within close dimensional limits.

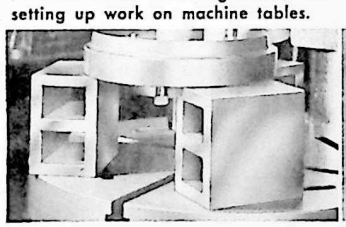
SPECIFICATIONS

Taft-Peirce Box Parallels are made of close grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. They are finish ground on all outside surfaces to listed dimensions within plus or minus .0005", with opposite sides parallel within .00025" in 6", and with adjacent sides square to within .0005" in 6".

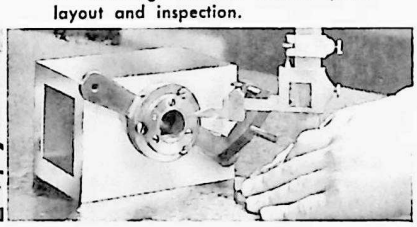
Style No.	Overall Dimensions			No. Square Cored Holes	Approx. Wall Thickness	Approx. Weight
	Length	Width	Height			
9160	6"	4"	4"	1	11/16"	14 lbs.
9161	6"	4"	6"	2	5/8"	22 lbs.
9162	12"	5"	8"	2	5/8"	55 lbs.
9163	16"	6"	14"	2	5/8"	92 lbs.
9164A	10"	10"	10"	4	3/4"	104 lbs.
9164B	12"	12"	12"	4	1"	197 lbs.

For additional data, see page 28, notes 1, 2, 3, 5, and 7

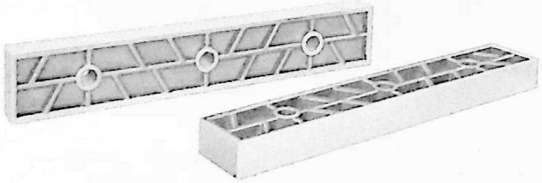
Close matching for size makes Box Parallels useful "building blocks" for setting up work on machine tables.



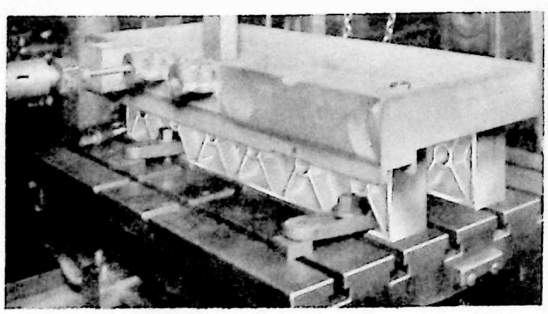
Box Parallels provide a quick means of mounting work for surface plate layout and inspection.



PLANER AND BORING MILL PARALLELS
NO. 9165 SERIES



Planer and Boring Mill Parallels save time in setting up heavy castings like this for machining and inspection.



These large parallels are made in five popular sizes for use in setting up work on planers, boring mills, radial drills, and surface plates. They are rigidly constructed with reinforcing ribs for maintained strength and accuracy. Cored holes are provided at intervals throughout their length for easy application of clamps.

SPECIFICATIONS

Planer and Boring Mill Parallels are made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. Top, bottom, and sides are precision ground with width and height held to size within plus or minus .0005", opposite faces parallel within .0005" throughout listed lengths, and adjacent surfaces square to within .0005" in 6".

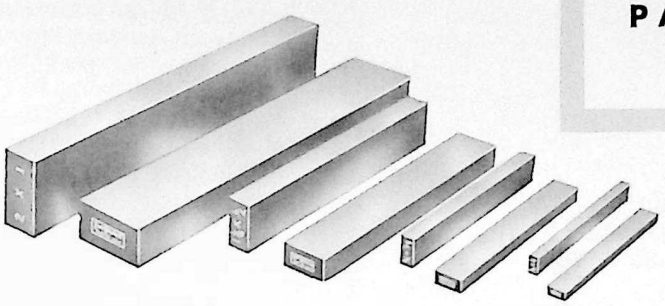
Style No.	Overall Dimensions			Approx. Diameter Cored Holes	Approx. Weight
	Length	Width	Height		
9165-24	24"	1½"	3"	1"	17 lbs.
9165-32	24"	2"	4"	1"	31 lbs.
*9165-40	24"	2½"	5"	1"	42 lbs.
*9165-48	36"	3"	6"	1¼"	82 lbs.
*9165-64	36"	4"	8"	1½"	120 lbs.

*Furnished to order from seasoned castings in stock.

For additional data, see page 28, notes 1, 2, 3, 5, and 7

STEEL PARALLELS

Hardened and Ground
NO. 9150 SERIES

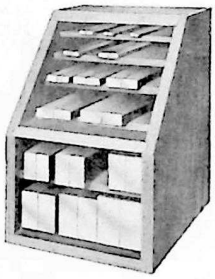


Taft-Peirce precision Steel Parallels are an essential part of the equipment of every toolroom and tool-inspection department. Stocked in thirty-nine sizes, they are a necessity for building up work in vises and on machine tables and for setting up and checking work on surface plates.

Steel Parallels are sold singly, but for convenience should be bought two of a size. They are also furnished in three Tool Crib Assortments as follows:

Set No. 9150A — 2 each of all 39 stock sizes
Set No. 9150B — 2 each of 12 sizes marked B in the table below
Set No. 9150C — 2 each of 16 sizes marked B and C in the table below

Also provided with each of these sets is a husky wooden cabinet, slanted in front to keep parallels of different lengths within easy reach.



Tool Crib Assortment No. 9150C. Each parallel has its size marked on one end for quick identification.

SPECIFICATIONS

No. 9150 Parallels are made of high quality alloy steel, scientifically heat treated for maximum stability and wear resistance. Each parallel is precision ground on all four sides within the limits of size and parallelism specified in the tolerance table, but is not made to be used as a square. Orders should indicate both Style No. and size.

TOLERANCES

Size Range	Size Tolerance	Parallel Over Entire Length Within
Widths up to and including 1⅛" Lengths up to and including 6"	±.0002"	.0001"
Widths over 1⅛" through 1½" Lengths over 6" through 8"	±.0003"	.00015"
Widths over 1½" through 3" Lengths over 8" through 12"	±.0004"	.0002"

THE FOLLOWING SIZES ARE CARRIED IN STOCK

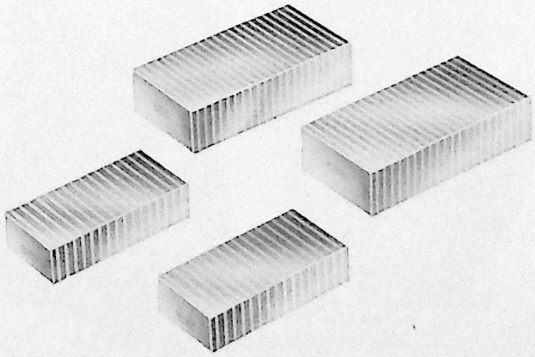
5/16 x ¼ x 5 (B)
⅜ x ¼ x 5
⅜ x 5/16 x 5 (B)
7/16 x ¼ x 5
7/16 x ⅜ x 5
½ x ¼ x 5 (B)
½ x 5/16 x 5
½ x ⅜ x 5
⅝ x ¼ x 6
⅝ x 5/16 x 6 (B)
11/16 x 9/16 x 6
¾ x ⅜ x 6 (B)
¾ x 7/16 x 6
¾ x ½ x 6
13/16 x ¼ x 6
13/16 x 5/16 x 6
13/16 x ⅜ x 6
⅞ x ¼ x 6
⅞ x 7/16 x 6 (B)
⅞ x ⅝ x 6
1 x ¼ x 6
1 x 5/16 x 6
1 x ½ x 6 (B)
1⅛ x 5/16 x 6
1⅛ x ½ x 6
1⅛ x ⅝ x 6 (B)
1⅛ x ¾ x 6
1¼ x ⅜ x 8
1¼ x ½ x 8
1¼ x ⅝ x 8 (B)
1½ x ⅝ x 8
1½ x ¾ x 8 (B)
1½ x 1¼ x 12
1¾ x ⅞ x 12 (B)
2 x 1 x 12 (B)
2¼ x 1⅛ x 12 (C)
2½ x 1¼ x 12 (C)
2¾ x 1⅜ x 12 (C)
3 x 1½ x 12 (C)

Letters B and C identify sizes included in Tool Crib Assortments 9150B and 9150C. Sizes not listed above can be furnished to order.

MAGNETIC PARALLELS

NO. 9805 SERIES

Magnetic parallels are used in setting up parts of irregular shape on magnetic chucks for grinding or inspection operations. Available in two sizes, they carry the magnetic holding force well above the working surface of practically any style or make of electromagnetic or permanent magnet chuck.



SPECIFICATIONS

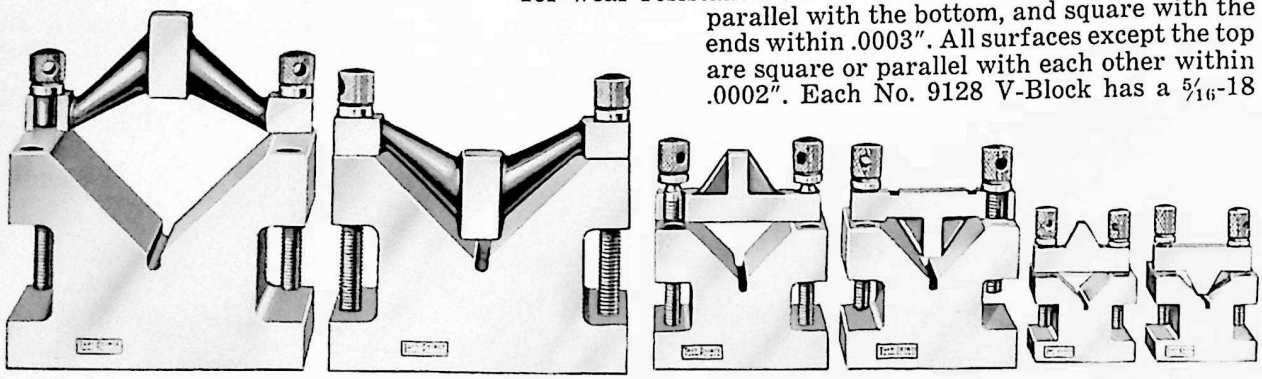
Magnetic Parallels consist of alternate laminations of brass and soft iron of high magnetic permeability. They are precision ground to size within .001" of given width and height, opposite sides being held parallel within .0002". Sold singly or in pairs.

Style No.	Overall Dimensions			Approx. Weight Each
	Length	Width	Height	
9805-1	3"	1½"	¾"	1 lb.
9805-2	4"	2"	1"	2½ lbs.

V-BLOCKS

Taft-Peirce V-Blocks offer a quick, positive means of holding work for layout, machining, and inspection. Reversible steel clamps provide true tangential contact on cylindrical work, and, on Style No. 9129 and 9130 V-Blocks, they may be swung aside or slipped off entirely for fast work insertion and removal. Blocks lie on sides or ends without interference from clamps.

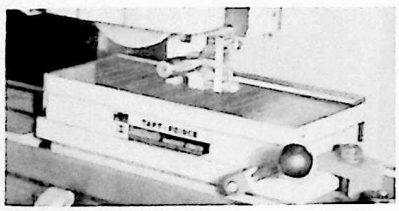
V-BLOCKS
NO. 9128-30 SERIES



SPECIFICATIONS

These V-Blocks are made of high quality alloy steel, scientifically heat treated for maximum stability and hardened for wear resistance. The 90° "V" is central with the sides, parallel with the bottom, and square with the ends within .0003". All surfaces except the top are square or parallel with each other within .0002". Each No. 9128 V-Block has a 5/16-18 tapped hole in the bottom for attaching to angle irons, face plates, etc. All sizes are furnished in pairs matched within the above tolerances and numbered for identification. Each block is provided complete with one clamp and two clamping screws.

Grinding flat on a cylindrical workpiece held in No. 9129 V-Block. Machine is the Taft-Peirce No. 1 Precision Surface Grinder.

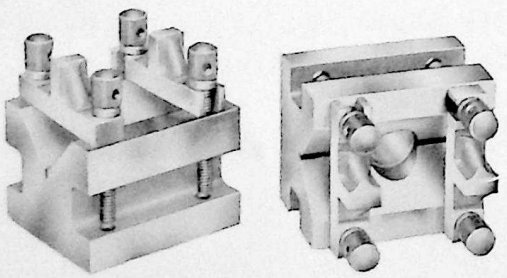


Style No.	Overall Dimensions			Max. Work Holding Capacity	Approx. Weight Per Pair
	Length	Width	Height		
9128	1⅜"	1⅜"	1⅛"	¾" dia.	1 lb.
9129	2⅛"	2⅜"	1⅞"	1½" dia.	4 lbs.
9130	2⅞"	4"	2⅞"	3" dia.	14 lbs.

For additional data, see page 28, notes 1, 7, and 8.

UNIVERSAL V-BLOCKS
NO. 9131

Universal V-Blocks have a ¾" hole in the center of the "V" which is useful in providing a clearance for drilling and boring operations. For convenient clamping to angle irons or face plates, the base ledge has four 5/16-18 tapped holes. The clamps do not interfere when the blocks are used on sides or ends, and they may be swung aside or removed entirely.



Style No.	Overall Dimensions			Max. Work Holding Capacity
	Length	Width	Height	
9131	2¾"	2⅝"	1⅞"	1½" dia.

Approx. Weight Per Pair — 6 lbs.

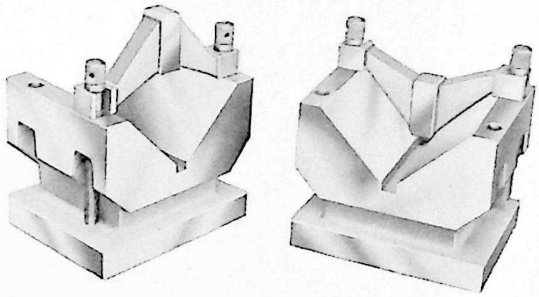
For additional data, see page 28, notes 1, 7, and 8

SPECIFICATIONS

No. 9131 V-Blocks are made of high quality alloy steel, scientifically heat treated for maximum stability and hardened for wear resistance. They are precision ground on all working surfaces, with the 90° "V" held central with the sides, parallel with the bottom, and square with the ends within .0003". All sides of the block are square with each other within .0001". Furnished singly or in pairs matched within the above tolerances and numbered for identification. Each block is provided complete with two clamps and four clamping screws.

NOTE: ¾" hole can be furnished lapped central with the sides and ends within .0002" and square with the bottom to within .0001"-priced upon application.

V-BLOCKS
NO. 9132



No. 9132 V-Blocks provide an intermediate work holding capacity between No. 9130 and No. 9133 V-Blocks. An unusually heavy body design combines a massive section for absolute rigidity and accuracy with an all-around base ledge that allows C-clamps, parallel clamps, and machine table straps to be applied in any position. The reversible work clamps do not interfere when the blocks are used on sides or ends, and they may be swung aside or removed entirely.

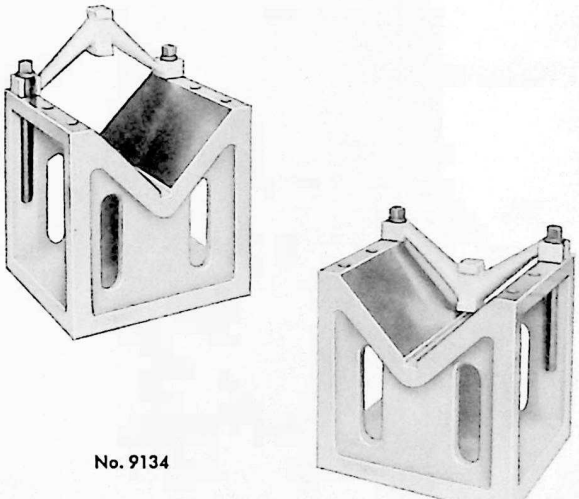
SPECIFICATIONS

No. 9132 V-Blocks are made of special analysis cast iron scientifically heat treated for maximum stability and hardened for wear resistance. The 90° "V" is precision ground central with the sides, parallel to the bottom, and square with the ends within .0003". All surfaces except the top are parallel and square within .0002". Furnished in pairs matched within the above tolerances and numbered for identification. Each block is provided complete with one clamp and two clamping screws.

Style No.	Overall Dimensions			Max. Work Holding Capacity	Approx. Weight per Pair
	Length	Width	Height		
9132	4"	5"	4"	3⅞" dia.	30 lbs.

For additional data, see page 28, notes 1, 7 and 8

V-BLOCKS
NO. 9133-34 SERIES



No. 9134

No. 9133-34 V-Block sides and ends have a full outline bearing area and convenient ledges for clamping in any position to machine tables and inspection plates. Both sizes feature an "open" body design to reduce weight, yet are strongly ribbed for strength. The reversible clamps do not interfere when the blocks are used on sides or ends, and they may be swung aside or removed entirely.

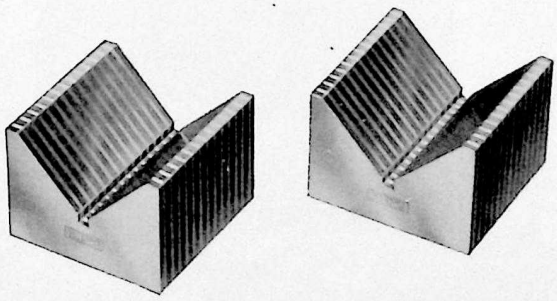
SPECIFICATIONS

These V-Blocks are made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. The 90° "V" is precision ground central with the sides, parallel with the bottom, and square with the ends within .0005". All surfaces except the top are square and parallel within .0005". Both sizes are furnished in pairs matched within the above tolerances and numbered for identification. Each block is provided complete with one clamp and two clamping screws.

Style No.	Overall Dimensions			Max. Work Holding Capacity	Diameter Bolt Holes	Approx. Weight per Pair
	Length	Width	Height			
9133	6"	6"	6"	4½" dia.	1 1/16"	42 lbs.
9134	8"	8"	8"	6⅜" dia.	1 1/16"	77 lbs.

For additional data, see page 28, notes 1, 7, and 8.

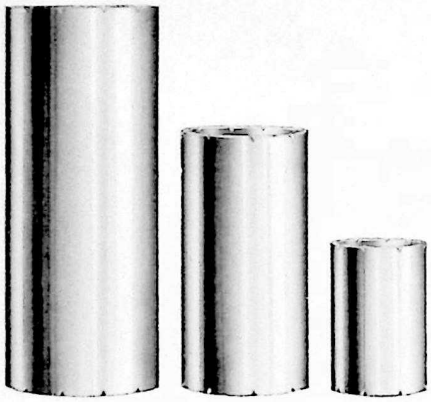
MAGNETIC V-BLOCKS
NO. 9806-1



Magnetic V-Blocks are used for building set-ups on magnetic chucks for work requiring surface grinding. Universal in application and effective on practically any style or make of face plate, they carry a magnetic chuck's holding power well above its working surface.

SPECIFICATIONS

No. 9806-1 Magnetic V-Blocks are constructed of alternate laminations of brass and soft iron of high magnetic permeability. The 90° "V" is central with sides and parallel with base within .0003". Ends are square with "V" and other surfaces within .001" and parallel to each other within .002". Overall dimensions: 2½" long x 2½" wide x 1¾" high x 2⅛" wide at top of "V". Approximate weight 2½ lbs. each. Sold singly or in pairs matched within specified tolerances and numbered for identification. For additional data, see page 28, notes 1 and 7.



CYLINDRICAL SQUARES
NO. 9141-43 SERIES

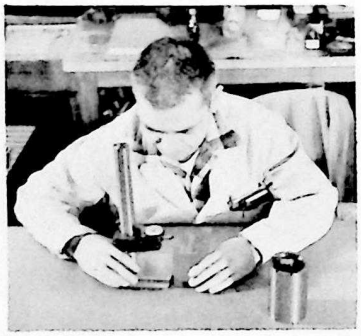
Cylindrical Squares, used on surface plates, provide one of the most reliable 90° reference standards available in industry today. Work may be placed against the periphery and sighted, or for greater convenience, the Cylindrical Square may be used to set a No. 9146 Comparator Square (below) for transfer type inspection with direct indicator squareness readings.

SPECIFICATIONS

Taft-Peirce Cylindrical Squares are made of high quality alloy steel, scientifically heat treated for maximum stability and wear resistance. The periphery is ground between centers straight and round within .0001" with an extremely fine micro finish. The ends, recessed and provided with self-cleaning dirt grooves, are ground and lapped square with the axis within 5 seconds of arc on the No. 9141, 3 seconds on the No. 9142, and 2 seconds on the No. 9143. Each square is packed in a finished wood case with hinged cover.

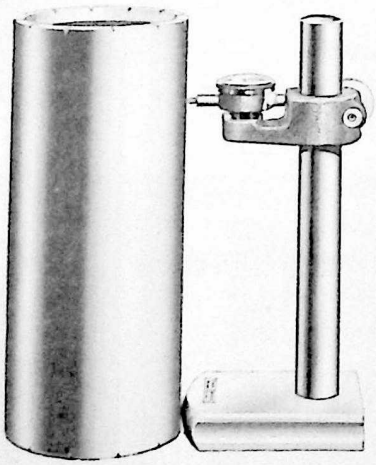
Style No.	Overall Dimensions		Approx. Weight
	Diameter	Height	
9141	3"	4½"	8 lbs.
9142	4"	8"	27 lbs.
9143	5"	12"	64 lbs.

For additional data, see page 28, notes 1 and 7



COMPARATOR SQUARE
NO. 9146

The Comparator Square is normally used with the Taft-Peirce Cylindrical Square to obtain direct readings of work squareness. It may also be used effectively with other vertical master reference surfaces. The popularity of this precision inspection tool lies in its positive operation that eliminates the guesswork hazards of sighting and using feelers. The Comparator Square requires no operator skill other than the ability to read an indicator. Instructions for transfer inspection of squareness using the Comparator Square are shown on the opposite page.



No. 9146 Comparator Square (right) with No. 9143 Cylindrical Square.

SPECIFICATIONS

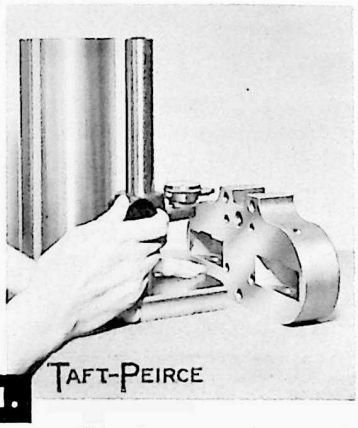
Base: hardened stainless steel, 5" x 3½" x 1" thick, serrated on the bottom for self-cleaning action and lapped flat for positive surface plate contact. *Column:* hardened stainless steel, 11 1/16" x 1¼" diameter. *Indicator Bracket:* seasoned cast iron; underneath slot allows ⅛" horizontal adjustment of indicator. *Dial Indicator:* AGD Group 1 with adjustable bracket type back, diameter 1 1/16", graduation .0001", range .025", dial reading 0-5-0. Furnished complete with indicator in finished wood case with hinged cover.

Style No.	Overall Dimensions			Height Range Dial Indicator*	Approx. Weight
	Length	Width	Height		
9146	5"	3½"	12 1/16"	2⅛"—11⅞"	9 lbs.

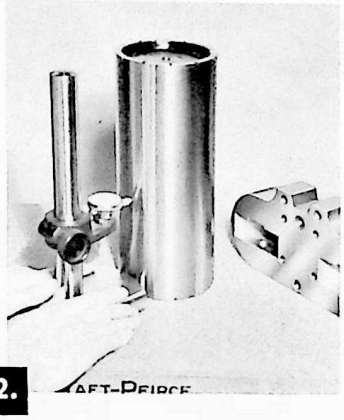
*Measured from surface plate to contact point

NOTE: Larger sizes available to special order.

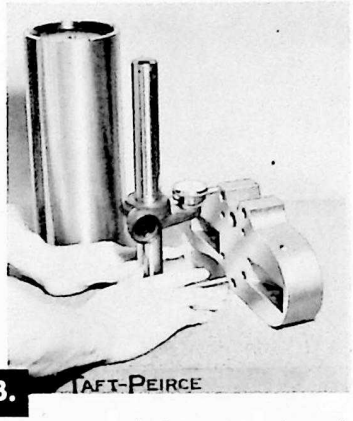
TRANSFER INSPECTION OF SQUARENESS USING CYLINDRICAL AND COMPARATOR SQUARES



1. Slide Comparator Square indicator bracket up or down column to working height. Tighten knurled knob to lock in position.



2. Rotate Comparator Square base against Cylindrical Square until the indicator registers its maximum reading. Set indicator to zero at that point.



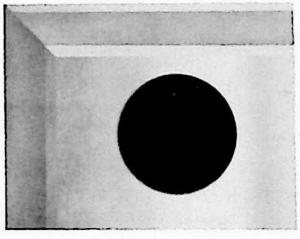
3. Rotate the base against the work, and the maximum indicator reading from zero represents the difference from absolute squareness.

IMPORTANT: The indicator must be reset at zero against the Cylindrical Square each time measurements are taken at a new height.

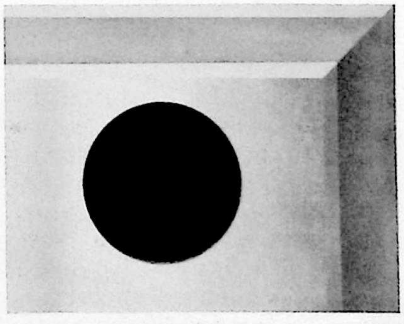
UNIVERSAL SQUARES
NO. 9330-31 SERIES

Designed especially for inspecting and setting up small parts made to extremely close tolerances, the Universal Square is an essential tool for every toolmaker, die maker, and inspector. The square is placed on a surface plate or machine table to present either knife edge to the work, providing a true line contact for accurate sighting and work setting. The Universal Square is also used extensively to set up optical comparators.

One piece construction plus precise manufacturing standards for squareness give the Universal Square a stability and accuracy not obtainable with stock-and-blade type squares. Hard rubber pads provide an excellent grip and prevent heat transfer from the hand.



No. 9330



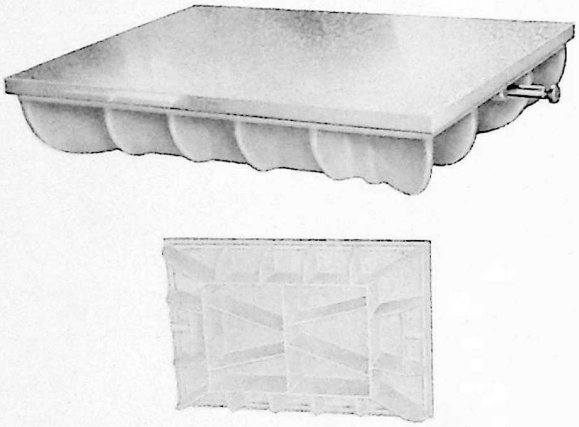
No. 9331

SPECIFICATIONS

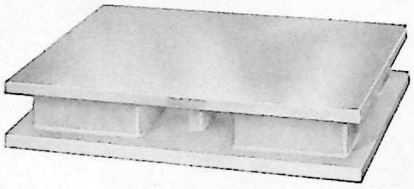
Universal Squares are made of high quality alloy steel, scientifically heat treated for maximum stability and wear resistance. Adjacent base faces and knife edges are lapped square to within .0001″ on the No. 9330 and .00015″ on the No. 9331. Both sizes furnished in lined leatherette case with snap lock.

Style No.	Overall Dimensions			Approx. Weight
	Length	Width	Thickness	
9330	2½″	2″	½″	½ lb.
9331	3¼″	2½″	9/16″	¾ lb.

CAST IRON SURFACE PLATES
NO. 9210-12 SERIES



DUPLEX BENCH BLOCK
NO. 9215



The Duplex Bench Block is a small, general purpose cast iron surface plate for use wherever a smooth, flat reference surface is desired. It provides two surfaces, both ground flat to .0005", one of which may be used for layout purposes, the other being kept in reserve for reference and inspection work. Many shops use this block as a convenient ready-made base for building small fixtures and tools.

The Duplex Bench Block is ribbed internally for strength and rigidity and stabilized for accuracy. Overall dimensions, 14" x 10" x 2⅜"; working surfaces, 7/16" thick; weight, 37 lbs. approx. Also available with one or both faces grooved for hand lapping — ½" mesh supplied unless otherwise specified. Special meshes or scraped blocks available to order.

Taft-Peirce Cast Iron Surface Plates provide highly precise reference surfaces for use in layout and inspection work. Cast from a special grade of iron, they are carefully heat treated and seasoned to insure permanent accuracy and freedom from internal stresses. Scientifically located ribbing insures strength, stability, uniform density, and lasting precision. For proper support and elimination of rocking and deflection, each plate rests on three precisely positioned mounting pads. The extra-thick working surfaces provide plenty of stock for reconditioning.

SPECIFICATIONS

No. 9211 Surface Plates are planed and hand-scraped to produce an average of eighteen bearing points per square inch. Surface accuracy for each size is indicated on the table below.

No. 9210 Surface Plates are furnished in all listed sizes with planed surface only. These are machined to order from seasoned castings in stock. Surface accuracy for each size is listed in the table below.

No. 9212 Surface Plates, ground and grooved for lapping, are furnished to order in all listed sizes up to and including 30" x 84" from seasoned castings in stock. Orders should indicate mesh pattern and spacing required.

Surface plates 18" x 18" and smaller are equipped with central lifting holes on the longer dimension. Surface plates 18" x 24" and larger are furnished complete with removable threaded lifting handles located on the longer dimension. In ordering, specify both Style Number and size.

Approx. Overall Dimensions, Inches			Approx. Thickness Working Surface, Inches	Surface Accuracy*±		Approx. Weight, Lbs.
Width	Length	Height		No. 9211 Scraped	No. 9210 Planed	
8	10	2½	5/8	.0001"	.0005"	22
10	12	2¾	5/8	.0001"	.0005"	35
12	12	3	11/16	.0001"	.0005"	40
12	18	3½	¾	.0001"	.00075"	70
13	15	3	11/16	.0001"	.00075"	50
14	14	3¾	¾	.0001"	.00075"	58
14	18	3¾	¾	.0001"	.00075"	85
14	24	4⅜	13/16	.0001"	.001"	105
18	18	3¾	¾	.0001"	.001"	100
18	24	4⅜	13/16	.0001"	.001"	145
18	36	5	⅞	.00015"	.0015"	235
24	24	4⅜	13/16	.00015"	.0015"	285
24	36	6½	1	.00015"	.0015"	370
24	48	7½	1	.00015"	.0015"	525
30	36	7¼	1 1/16	.00015"	.0015"	560
30	48	8	1⅛	.00015"	.0015"	725
30	60	9	1 3/16	.00025"	.002"	1020
30	72	9½	1¼	.00025"	.002"	1200
30	84	10	1¼	.00035"	.0025"	1400
36	36	7¾	1 1/16	.00015"	.0015"	700
36	48	8½	1⅛	.00025"	.002"	1000
36	60	10	1¼	.00025"	.002"	1250
36	72	10	1¼	.00035"	.0025"	1500
48	72	10	1½	.0004"	.003"	2000
48	96	12	1½	.0006"	.004"	3000
48	144	14½	1⅝	.0009"	.005"	6000

For additional data, see page 28, notes 7 and 9

*The bearing areas of the working surfaces shall not deviate from a mean plane by more than specified above. No adjacent square foot areas shall vary with each other by more than .0001".

GRANITE SURFACE PLATES
NO. 9213 SERIES

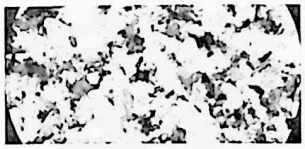
Taft-Peirce Granite Surface Plates are manufactured from the finest available granites, precision ground and lapped to produce the most accurate flat reference surface available today. All Taft-Peirce Granite Surface Plates are serial numbered and are shipped with individual certificates of inspection. Surface accuracy is not affected by ordinary temperature changes, nor does granite have internal stresses. Heavy or pointed objects accidentally dropped on the surface barely powder the stone at the point of impact, leaving no compensating humps to impair surface accuracy.

SPECIFICATIONS

No. 9213 Granite Surface Plates are finished to the surface accuracies listed in the table below according to the type of plate selected, i.e. laboratory, inspection, or toolroom. *2-Ledge Granite Surface Plates* will have the ledges on the longest surface dimension unless otherwise specified.
Orders for Granite Surface Plates should specify style number, color, size, grade, and number of ledges.

FACTS ABOUT GRANITE SELECTION

GRAY
STYLE NO. 9213G



A medium grained granite with good quartz content. Good hardness. High resistance to normal wear and abrasion. Pleasing color with good wear life. An exceptionally good value. Most economical of all plates.

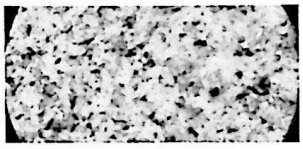
BLACK
STYLE NO. 9213B

One of the most popular plates available because of color. Very durable due to high density grain structure. Less wear resistant than others as little or no quartz content. Color easy on the eyes. Economy in the middle range.

PINK
STYLE NO. 9213P

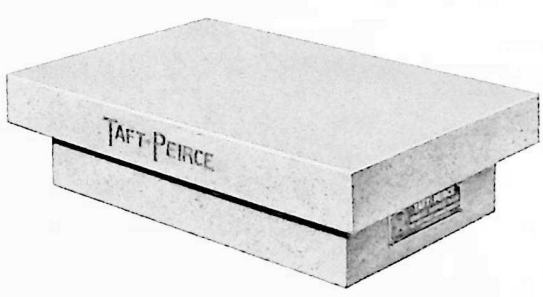
A medium-coarse grained granite. Pleasing color with high quartz content. Extremely hard, providing excellent wear life. Not as damage resistant as other colors due to coarse grain structure. Good buy considering long wear life.

BLUE-WHITE
STYLE NO. 9213BW



A premium granite. Extremely fine grained with an exceptionally high quartz content uniformly distributed providing the ultimate in hardness. Highly damage resistant. The plate to consider when the finest in quality is required.

Overall Dimensions, Inches			Surface Accuracy*[1] ±			Approx. Shipping Weight, Lbs.
Width	Length	Height	Laboratory*[2]	Inspection*[2]	Toolroom*[2]	
9	12	3	.000025″	.00005″	.0001″	32
12	18	4	.000025″	.00005″	.0001″	88
18	24	4	.000025″	.00005″	.0001″	175
24	24	4	.000025″	.00005″	.0001″	235
24	36	6	.000025″	.00005″	.0001″	535
24	48	8	.00005″	.0001″	.0002″	715
30	36	6	.00005″	.0001″	.0002″	680
30	60	10	.0001″	.0002″	.0004″	1500
36	48	8	.000075″	.00015″	.0003″	1075
36	60	10	.0001″	.0002″	.0004″	1800
36	72	12	.00015″	.0003″	.0006″	2650
48	48	8	.0001″	.0002″	.0004″	1450
48	72	12	.00015″	.0003″	.0006″	3590
48	96	14	.0002″	.0004″	.0008″	6250
48	120	16	.0003″	.0006″	.001″	8600
48	144	16	.0005″	.0006″	.0012″	10,200
60	72	12	.00015″	.00035″	.0006″	5150
60	120	16	.00035″	.00075″	.0011″	12,350



Style No. 9213BW 4-Ledge Blue-White Granite Surface Plate.

Sizes not listed, special sizes, special accuracies, thd. inserts, holes, slots, etc. on application

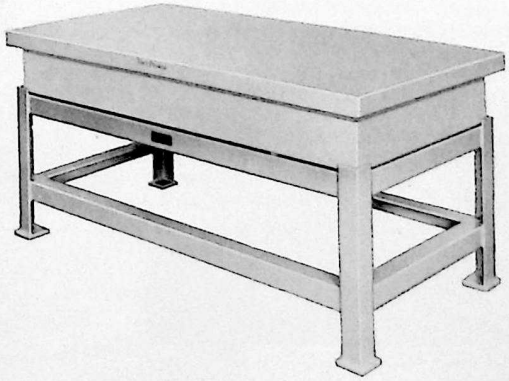
*[1]Accuracy listed for each size is that no point on the work surface shall vary from a mean plane thereof by more than the amount specified in the table (Reference Federal specification GGG-P-463.)

*[2]Available in 4-Ledge, 2-Ledge, and O-Ledge types.

SURFACE PLATE STANDS

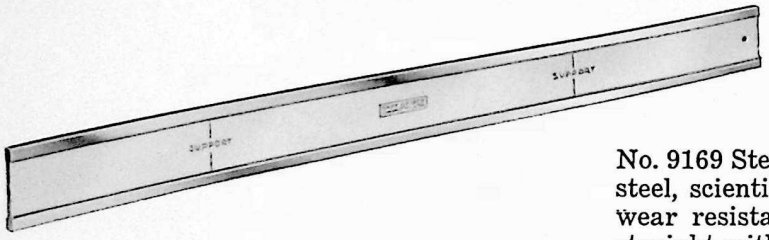
Surface Plate Stands are recommended for all Taft-Peirce Cast Iron and Granite Surface Plates 24″ x 36″ and larger. Made of high grade structural steel, these rugged stands are functionally designed to hold the surface plate at its proper support points and position the working surface at a comfortable height from the floor.

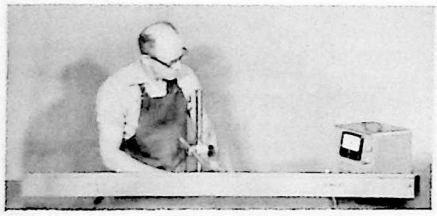
Since support requirements vary depending on surface plate size, and differ between cast iron and granite, orders should specify plate size, material, and Style Number. Stand feet are drilled for bolting to the floor, and can be provided with leveling screws or casters if desired.



STEEL STRAIGHT EDGES
NO. 9169 SERIES

Taft-Peirce Steel Straight Edges provide an extremely accurate reference surface for scribing straight lines and for checking surface straightness and flatness. All sizes are proportioned for proper balance between rigidity and weight. Sizes 24″ and longer have marked support points which should be used to minimize deflection due to gravity. Properly supported and cared for, these straight edges will retain their accuracy almost indefinitely. When not in use, they should be hung vertically by the hole provided in one end. Steel Straight Edges may be readily self-checked by inverting them on proper support points and indicating both sides at the center.





Checking the accuracy of a properly supported Steel Straight Edge. One edge is indicated in the center as shown; then the straight edge is turned over and the opposite edge indicated in the same manner.

SPECIFICATIONS

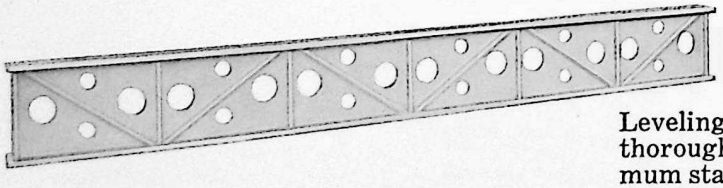
No. 9169 Steel Straight Edges are made of high quality alloy steel, scientifically heat treated for maximum stability and wear resistance. Edges are precision ground parallel and straight within limits listed in the table below. 12″, 24″ and 36″ Straight Edges are shipped from stock; larger sizes are finish ground to order from heat treated blanks carried in stock. Orders should specify both Style Number and length.

Style No.	Overall Dimensions			Parallelism & Straightness, Full Length	Approx. Weight
	Length	Width	Thickness at Edges		
9169	12″	1½″	¼″	.0001″	1 lb.
9169	24″	2″	5/16″	.0002″	4 lbs.
9169	36″	2½″	⅜″	.0003″	8 lbs.
9169	48″	3″	7/16″	.0004″	16 lbs.
9169	60″	3½″	½″	.0005″	26 lbs.
9169	72″	4″	½″	.0006″	36 lbs.
9169	96″	5″	⅝″	.0008″	60 lbs.
9169	120″	6″	¾″	.0010″	90 lbs.

For additional data, see page 28, notes 1 and 7

LEVELING STRAIGHT EDGES
NO. 9168 SERIES

No. 9168 Leveling Straight Edges have flat, parallel faces, and are specifically designed for setting up and leveling machinery and for checking and spotting bearing surfaces during hand scraping operations. Properly supported, they may be used with various indicating devices to check the surface flatness of large machined areas. All sizes feature I-beam construction for maximum strength and are cored and ribbed for balanced lightness and rigidity. Leveling Straight Edges may be readily self-checked by inverting them on proper support points and indicating both sides at the center.



SPECIFICATIONS

Leveling Straight Edges are made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability. Top and bottom surfaces are planed and hand scraped flat, straight, and parallel within tolerances listed in the table. All sizes are finished to order from seasoned castings in stock. In ordering, specify both Style Number and length.

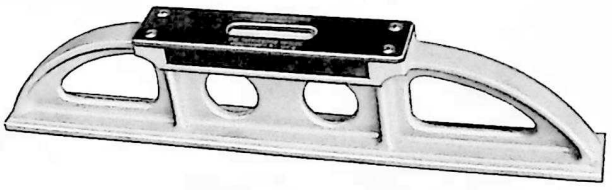
Style No.	Overall Dimensions			Tolerances		Approx. Weight
	Length	Width	Thickness at Edges	Straightness*	Parallelism	
9168	36″	8″	2½″	.0002″	.0002″	60 lbs.
9168	48″	8″	2½″	.0003″	.0002″	70 lbs.
9168	60″	8″	2½″	.0004″	.0003″	100 lbs.
9168	72″	8″	2½″	.0005″	.0003″	125 lbs.
9168	96″	9½″	3″	.0006″	.0003″	410 lbs.
9168	120″	11″	3¼″	.0007″	.0004″	510 lbs.

For additional data, see page 28, notes 1 and 7

*Overall straightness is precisely checked at the factory to within the tolerance listed for each size. In use, however, straightness is a function of proper selection of support points, which, while not critical for the 36″ and 48″ sizes, should be located 6″ to 18″ from the ends for the 60″ size, 13″ to 20″ for the 72″ size, 20″ to 26″ for the 96″ size, 25″ to 30″ for the 120″ size, and 28″ to 35″ for the 144″ size.

PRECISION LEVELS
NO. 9167 SERIES

These sensitive levels are recommended for use as master reference standards in leveling machine tools, surface plates, and delicate measuring instruments. They consist of a graduated vial cemented into an adjustable holder, which in turn is recessed into a heavy cast iron base. Each level is precisely calibrated before shipment, but in case its accuracy is accidentally disturbed, the vial holder may be adjusted by means of three triangularly located set screws. An aluminum cover plate protects the vial from breakage and prevents unauthor ized tampering with the vial holder adjustment.

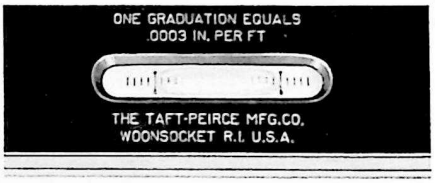


SPECIFICATIONS

The Level base is made of close-grained cast iron, thoroughly seasoned and carefully heat treated for maximum stability, with its bottom carefully hand scraped to a true bearing surface. Each vial is graduated to both the left and right of true horizontal, permitting direct readings of variations indicated by the position of the bubble. Unless otherwise specified, No. 9167 Precision Levels are supplied in finished wood cases. Orders should specify both Style Number and graduation.

Style No.	Overall Dimensions			Value Each Vial Graduation	Approx. Weight
	Length	Width	Height		
9167	18"	1¾"	3⅞"	.0003" per foot	8 lbs.
9167	18"	1¾"	3⅞"	.0005" per foot	8 lbs.

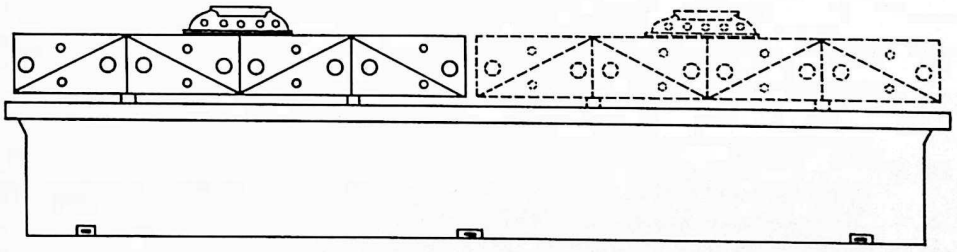
No. 9167 Precision Level vials are graduated to both the left and right of true horizontal. The value of each graduation is clearly marked on the cover plate.



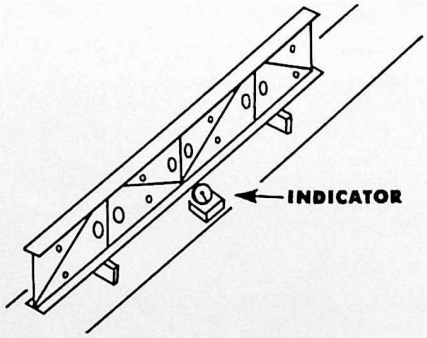
SUGGESTIONS FOR LEVELING MACHINE TOOLS

. . . using No. 9167 Precision Level with a No. 9168 Leveling Straight Edge of appropriate Length and a No. 9165 Planer Parallel.

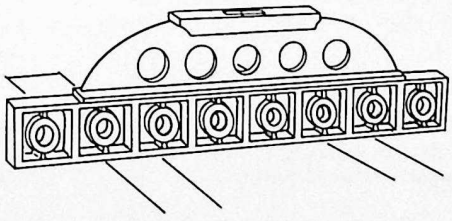
1. Level extreme ends of machine bed (in steps of 12 ft. on very long machines) by mounting the level above a flat way with its base extended by means of a properly supported leveling straight edge. On machines with short beds, place the level directly on the flat way.



2. Level the bed at intermediate points by indicating between the straight edge and the bed. A machinist's surface gage and indicator may be used for this check.

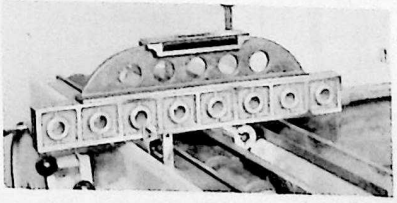


3. Check levelness across the bed by using the level with its base extended by a planer parallel. Check level reading at various points along the bed to determine presence of wind or twist.



4. Repeat steps 1, 2, and 3 in sequence, adjusting machine leveling screws until the desired accuracy has been obtained.

NOTE: In leveling machines with V-ways or other special way sections, auxiliary tools such as rolls or V-blocks may be used for locating the level. In the illustration below, a planer parallel and level are mounted on a precision roll and planer gage for checking across the ways of a surface grinder.



CONTRACT TOOLMAKING FACILITIES

The Taft-Peirce Tool Room, a completely staffed and self-contained department of the world-famous Taft-Peirce Contract Service Division, offers a professional toolmaking service tailor-made to fit the requirements of both large and small companies for jigs, fixtures, dies, gages, templates, molds, and similar special equipment.

Tools can be produced from designs created by Taft-Peirce staff engineers or from those furnished by the customer. Services range from packaged tool design and toolmaking programs to individual designing, machining, and heat treating projects. An experienced estimating staff is available for quoting firm prices, and all operations can be handled on a confidential basis if required.

Other Taft-Peirce Contract Services include prototype design and development, machine design and building, and complete production and assembly of any product or device in the mechanical or electro-mechanical fields. For complete information, write for Catalog No. 814, "Taft-Peirce Contract Manufacturing Facilities."

REFERENCE NOTES

The following notes explain references listed by number for certain tools appearing in this catalog. These numbered references will be found under the table of sizes in individual listings of standard tools. For additional information on equipment with special features, contact your Taft-Peirce Representative, or write direct to the plant.

NOTE 1—These tools are regularly manufactured in extra large sizes or to other customer requirements for size, tolerance, and material.

NOTE 2—These tools can be furnished in ground matched pairs.

NOTE 3—These tools can be furnished scraped individually or in scraped matched pairs.

NOTE 4—These tools can be furnished in matched pairs.

NOTE 5—Unless otherwise specified, when ordered scraped, these tools will not be scraped on edge faces.

NOTE 6—When ordered scraped, these tools will be scraped on all finished surfaces.

NOTE 7—Reconditioning service available for these tools.

NOTE 8—Extra clamps and clamping screws available from stock. In ordering, give Style Number of V-Blocks.

NOTE 9—Special Surface Plates with holes, keyways, T-slots, or other alterations furnished to order.

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Taft-Peirce Products and Services

Production and Inspection Equipment

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- Angle Plates
- Bench Blocks
- Bench Centers
- Levels
- Parallels
- Sine Angle Plates
- Sine Bars
- Sine Blocks
- Squares
- Straight Edges
- Surface Plates
- Toolmakers Knees
- V-Blocks

Fixed Gages

- Cylindrical Plug and Ring Gages
- Thread Plug and Ring Gages
- Adjustable Limit Snap Gages
- Master Setting Discs
- Thread Measuring Wires

Machine Tools

- Series 100 Precision Surface Grinder
- No. 2 Precision Surface Grinder
- Special Machine Tools

Microstoning Equipment

- No. 9681 Microstoning Attachment
- No. 9689 Centerless Microstoning Machine
- No. 9698 Skip-Thru Microstoning Machine
- Microstones
- Filter Wagon

Contract Services

- Development Work
- Tool Design
- Machine Design
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- Special Machinery
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- Mark III Semi-Conductor Dicing Machine

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